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PROJECTS OF THE INDUSTRIAL POLLUTION CONTROL BRANCH

Federal Water Quality Administration
Washington, D. C.

July 1970

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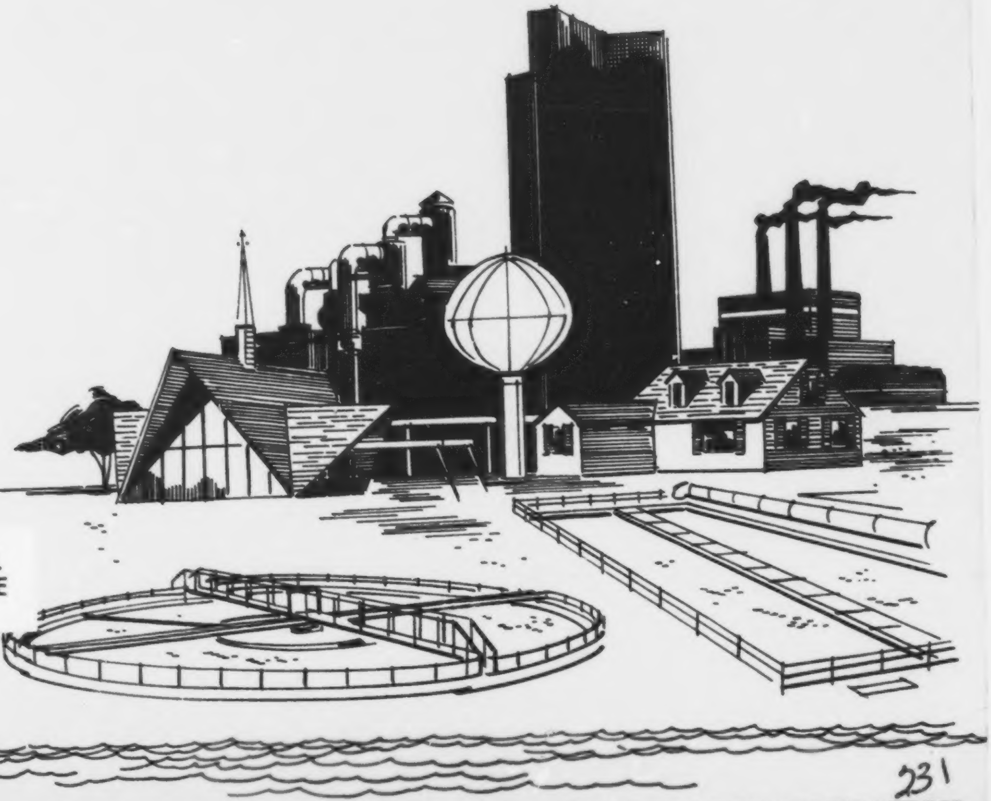

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DEPARTMENT OF THE INTERIOR • FEDERAL WATER QUALITY ADMINISTRATION

PROJECTS

INDUSTRIAL POLLUTION CONTROL BRANCH

William J. Lacy, Chief

July 1970

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Division of Applied Science and Technology
Office of Research & Development
Federal Water Quality Administration
UNITED STATES DEPARTMENT OF THE INTERIOR

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INTRODUCTION

On formation of the National Industrial Pollution Control Council, President Nixon said "It would be unrealistic, of course, to think that private enterprise could meet this problem alone. The problem of the environment is one area where private enterprise can do the job only if government plays its proper role."

The general goal of Research and Development in industrial waste treatment, both by industry and by industry cooperating with government, is to obtain, for the benefit of improved water quality enforcement, proven methods of control and treatment for all wastes from industry at reasonable costs. Many of the wastes from industry can be handled by the present state-of-the-art technology. However, this technology is limited in the number of proven techniques available.

The ultimate goal of the FWQA, in cooperation with industry whenever possible, is to develop and demonstrate alternative economical treatment techniques and advanced waste treatment systems directed toward closed-loop systems.

Presently there are 158 completed or on-going projects sponsored under the Industrial Pollution Control Branch Program. Approximately 300 "needs" have been logged into the Research Program Planning System. These "needs" will require a great deal of refinement and work effort to optimize and assemble them into a priority list cognizant with the FWQA program objectives and mission. Some of these needs may lack sufficient priority of importance to merit funding by FWQA.

FWQA intends to develop and demonstrate the necessary treatment techniques for significant industrial wastewaters to the extent necessary to meet water quality criteria and eventually to permit total water reuse.

As indicated above, many if not most of the industrial sources of pollution can be controlled with existing technology. It is the responsibility of industry to undertake this effort with its own resources. In certain instances new technology may provide methods for attaining higher water quality or lower costs, or both, relative to existing techniques.

This new technological development involves risks normally not associated with the profit orientation of the particular industry. In a number of concepts, even the obvious will not be undertaken unless incentives are provided, both technical and economic. FWQA provides both by assisting in evaluating applications and suggestions and at times provides additional technical input to projects as well as cooperative grant dollars. It should be recognized that a good many of our grants are well below the 70% statutory authorization for Federal participation. The industry grantee in turn is obliged to provide proper evaluation resources and information to the public as well as acquiescing to a variety of other public regulations which require time and resources.

In the joint committee conference on this portion of the Act, it was stated by Congressman Cramer . . . "that industries should be brought into the research program and that these efforts should contribute toward control of water pollution in as effective a way as possible . . .". The program of the Industrial Pollution Control Branch is accomplishing this goal.

INDUSTRIAL WATER REUSE

The program goal of industrial water reuse and product (or by-product) reocvery is economically, technically and philosophically sound.

The waste products must be considered an integral part of any manufacturing process and the cost of treatment of industrial wastes must be included in the pricing of the product. Waste disposal operations normally result in a net cost to the industry producing the waste. However by-product recovery and utilization techniques will reduce the cost of treatment and frequently proves to be less expensive than other methods of disposal.

Recycled water ultimately may be the most valuable product due to supply shortages increasing water supply costs, increasing water treatment costs and mounting municipal sewerage charges. The recovery of product fines, useable water and thermal energy are key methods of reducing overall waste treatment costs and must always be considered. Recovery of by-product from solid wastes is now outside the scope of the present program report. There are many products being recovered but there are a great many more that are not currently being recovered that could be recovered.

Frequently, waste streams can be eliminated or significantly reduced by process modifications or improvements. One notable example of this is the application of save-rinse and spray-rinse tanks in plating lines. This measure brings about a substantial reduction in waste volume as well as a net reduction in metal dragout.

One of industries' principal requirements of waste treatment, by-product recovery, and water reuse is that the main product or products of the plant be satisfactory to the consumer and that the operation of the plants be efficient and economical.

Through cooperation with the FWQA program, industries in general are becoming more aware of the need for overall pollution control and product (or by-product) recovery. This is not only because pollution effects the environment but also because it effects the general public who are the costumers. In addition, industries too depend upon our nations rivers and streams for suitable water for their manufacturing processes.

INDUSTRIAL POLLUTION CONTROL TECHNOLOGY

INTRODUCTION

Industries use huge quantities of the Nation's waters and are the major factor in the continuing rise in water pollution. They utilize over 15 trillion gallons of water but, prior to discharge, treat less than 5 trillion gallons. In terms of a single pollution parameter (BOD), waste generated by industries are equivalent to a total population of over 360 million people. Even more undesirable than the BOD loads of industrial effluents are the enormous quantities of mineral and chemical wastes from factories which steadily become more complex and varied. They include metals such as iron, chromium, nickle, and copper; salts such as compounds of sodium, calcium, and magnesium; acids such as sulfuric and hydrochloric; petroleum wastes and brines; phenols, cyanides; ammonia; toluene; blast furnace wastes; greases; all varieties of suspended and dissolved solids; and numerous other waste compounds. These wastes degrade the quality of receiving waters by causing tastes, odors, and color; and excess mineralization, salinity, hardness, and corrosion. Some are toxic to plant and animal life.

The variety and complexity of inorganic and organic components contained in industrial effluents present a serious liquid wastewater treatment control problem in that the pollution and toxicity effects of these constituents are of greater significance than those found in domestic wastewaters.

Conventional wastewater treatment technology which is often adequate for existing waste types, offers even less promise of providing the type and degree of treatment to be required in the near future. Industrial pollution control technology, therefore, must be developed and demonstrated to achieve effective and economical control of pollution from such industries as those producing metal and metal products, chemical and allied products, paper and allied products, petroleum and coal products, food and kindred products, textiles and leather goods.

To continue the attack on the problem of industrial pollution will require a cooperative industry-government effort to conceive, research, develop, and demonstrate treatment processes, production modifications, water reuse and water conservation programs. The ongoing research and demonstrations, funded by Section 6 grants, have been made to manufacturers and processors representing about every major source of industrial pollution.

The continued and expanded support is urgently needed specifically to implement the demonstration R&D programs related to new or improved technology for the treatment, reuse, and/or disposal of industrial wastewaters and their sludge residues. Existing data suggests that about half of the total volumes of wastes processed by municipalities is of industrial origin. Emphasis must be continued to achieve the most effective water pollution control by means of joint municipal-industrial treatment. Another key area where the efforts must be expanded involves the demonstration of by-product recovery and utilization.

In this respect, the most promising and beneficial area requiring additional support is the implementation of closed-loop (water reuse) treatment systems for the industry.

An accelerated industrial pollution control research, development, and demonstration program will measurably decrease the amount of expenditures needed to accomplish these goals, increase the efficiency of treatment, and eliminate the gaps in treatment technology.

OBJECTIVE

The objective of the industrial pollution control R&D program is to develop and demonstrate the required technology to achieve required degrees of pollution control by least cost methods for all significant industrial sources of pollution.

PROGRAM OF WORK

The program includes all research, development, and demonstration efforts necessary to resolve industrial pollution problems.

The objectives will be met by using the research and development grant mechanism, supplemented by in-house laboratory programs. The IPCB*will implement and administer demonstration projects for new and novel industrial wastewater treatment projects applicable for the majority of all significant industries. These demonstrations will include the latest developments in physical, chemical, biological, and combinations of treatment methods. It is expected to develop further the cooperation of industry to participate in meaningful pollution abatement demonstrations and to increasingly demonstrate the feasibility of in-plant measures, by-product recovery, and wastewater reuse as methods to abate pollution and to reduce treatment costs.

Research through in-house efforts and by contracts to industries and universities are to complete state of the art studies related to treatment and control technology for selected industry groups. Similarly, industrial wastewaters are to be identified, characterized, quantitized and classified for all industries of pollutional significance.

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*The Industrial Pollution Control Branch

NEED[1]

Industrial wastes are the Nations principal point sources of controllable waterborn wastes. In terms of the generally quoted measurements of strength and volume, gross wastes of manufacturing establishments are about three times as great as those of the Nation's sewered population (reference Table I). Moreover, the volume of industrial production, which gives rise to industrial wastes, is increasing at about 4.5% a year or three times faster than the population. Also significant is the variance of composition of industrial wastes, which contain all known pollutants of concern in water pollution abatement as well as some unidentified factors.

Table I shows reported quantities of industrial wastewaters discharged in 1963 and FWPCA estimates of the quantities of standard biochemical oxygen demand (BOD_5) and settleable and suspended solids contained in the wastewaters. The wasteload estimates, based upon an estimate of the "average" quantity of pollutant per product unit, indicate that the chemical, paper, and food and kindred industrial groups generated about 90% of the BOD_5 in industrial wastewater before treatment.

Similar statistics on net wasteload discharges are not completely available. However, indications are that the extent of industrial wastewater treatment is not greater than that currently practiced for municipal wastewaters.

Industrial wastes differ markedly in chemical composition, physical characteristics, strength, and toxicity from wastes found in normal domestic sewage. Every conceivable toxicant and pollutant of organic and inorganic nature can be found in industrial wastewaters, as indicated in Table II for selected industries. Thus, the BOD_5 or solids content often are not adequate indicators of the quality of industrial effluents. For example, industrial wastes frequently contain persistent organics which resist the secondary treatment procedures applied normally to domestic sewage. In addition, some industrial effluents require that specific organic compounds be stabilized or that trace elements be removed as part of the treatment process.

It is therefore necessary to characterize each industrial wastewater to permit comparative pollutional assessments to be made for individual industries as well as industry groups. Characterization will permit classifying the components of industrial wastewaters into as few as four basic classes of pollutants to more readily collate pollution statistics and to evaluate economics of methods of treatment as well as to project lease cost methods. Proposed generalized basic classification parameters are BOD, COD, SS, and TDS into which all known pollutants can be classed. Also required is the establishment of a relative pollution comparative index for all significant pollutants. This index in combination with the known characteristics and volume of a wastewater will determine the relative gross pollution severity of all industrial wastes and establish a basis for comparing the severity of pollution from industries.

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[1] Note the 1200 program described herein does not include thermal pollution requirement and associated problems.

Table III presents permissible criteria for surface water for public supplies as obtained from the Report of the Committee on Water Quality Criteria, April 1, 1968. The addition of an assumed BOD_5 value of 5mg/lto these criteria permits comparisons of the listed pollutants to be made against a unit of BOD. Under these circumstances it is relatively apparent that pollutants such as Endrin and Phenol (on a mg/l concentration equivalent basis) are 5000 times more critical as pollutants than BOD. Further work in this area will permit establishment of more accurate priorities in terms of our nations most critical needs.

Industrial wastes will require the development, demonstration, and evaluation of treatment methods suitable for each significant industrial waste type which is significantly different from domestic waste.

Table IV is a listing of all major industry groups and industries of suspected significant contributions to water pollution. These have been selected on the basis of a process water intake of at least 1 billion gallons per year and with regards to the potential for pollution from the process use of the water. For program planning and budgeting purposes, the industries are grouped into thirteen subprogram elements as shown in column two of Table VI. Within each element, the identity of industry group(s) by their Standard Industrial Classification code number is also presented as in column two of Table IV.

The industries listed in Table IV number approximately 150 and represent potentially equally numerous wastewaters of significantly different characteristics, for which treatment technology must either be developed or upgraded. The interchangeability of treatment technology between similar types of wastewaters is anticipated but will have to be demonstrated through results of grant research projects, or in house studies. Because resource allocations may not be sufficient to encompass the potential R&D demand imposed by the diverse nature of industrial wastes, a priority system must be established and used in the allocation of R&D efforts for industrial wastewater problems.

At this time a firm priority for R&D activities based on an ultimate comparable basis of pollution severity, has not been established for industrial wastes. However, a cursory examination of Table I, and assuming the (BOD_5) parameters of pollution severity as the prime indicator of pollution, initial basis for ranking the industry groups for priority R&D efforts, is possible. However, knowledge of all chemical and physical parameters of pollution, as well as the state of the art and economic considerations are necessary to more adequately assess priority for R&D investments.

Table V lists National Priorities for pollution sources. These were established on the basis of best available information in order to establish the initial base.

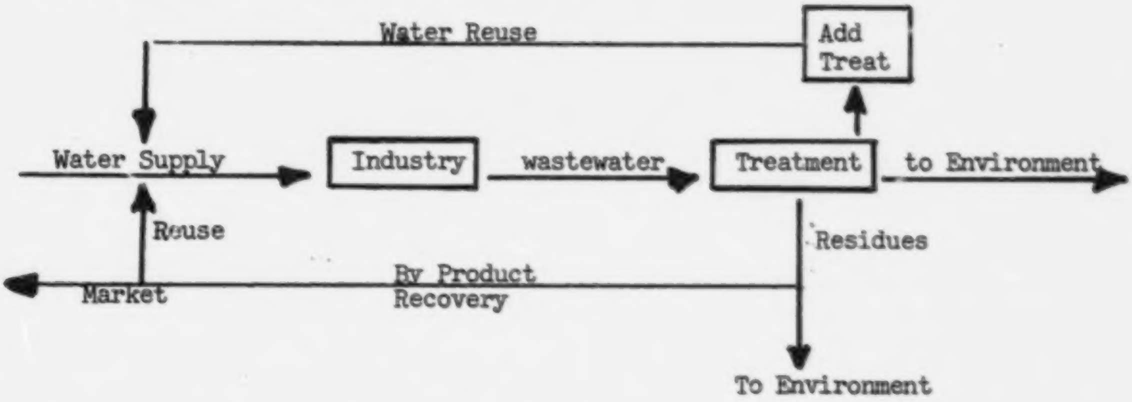
In spite of the complexity and magnitude of industrial pollution, initial estimates of the costs of clean waters from industrial sources have been made. As summarized in Table VII industrial capital requirements to abate pollution by 1973 to the extent of providing 85% treatment effectiveness, are substantially less than estimated capital requirements for municipal treatment or collection facilities for separting combined sewers, while the gross pollutional load contributed is substantially greater than either. This indicates that the average cost of industrial waste treatment is substantially less than for municipal waste treatment when based on treatment cost per lb BOD. If these estimates are reasonably accurate it would appear that for the most part industrial pollution control to the equivalency of secondary treatment is within a reasonable cost and need only be developed and demonstrated for the various industries in our economy which are significant contributors of pollution.

In summary the needs show that the 1200 program must be primarily dedicated to the attainment of:

1. Qualifying and quantitizing industrial wastes and treatment practices.
2. Implementation of undemonstrated but feasible treatment methods to as many types of industries as possible.
3. Reduce cost of treatment by the beneficial recovery and reuse of wastewater contaminants.

PLAN

1. Technical Consideration: The alternatives in wastewater treatment are shown in summary flow diagram below.



The alternatives shown primarily consist of:

- a. Wastewater Treatment (as required to abate pollution to meet water quality standards)
  - (1) for discharge (to meet necessary water quality criteria)
  - (2) for reuse (to meet industrial water quality demands to conserve water and offset cost of treatment).
- b. In-plant Measures (to reduce pollutants and water discharge)
  - (1) Operational (housekeeping techniques and manufacturing procedures)
  - (2) Design (to permit reuse, to reduce wastewater generation)
- c. Residue Treatment
  - (1) By-product recovery (to reduce gross disposal, utilizes values)
  - (2) Residue stabilization (to meet environmental standards)
- d. Combined Methods
  - (1) Joint Treatment (to utilize scale factors, off peak capacity, synergistic effects)
  - (2) Others (combined a-b-c methods as appropriate)

The alternatives best suited for implementation in specific 1200 programs will depend on many factors and local conditions. Where the state-of-art of treatment is essentially non-existing, emphasis on treatment to meet environmental standards should prevail. For nonprogressive industries, in-plant measures should be explored for potential application. For industries which have demonstrated effective treatment methods, lower cost alternatives of treatment stressing reuse and by-product recovery should be given consideration.

GOALS

1. General: To provide each basic industry the demonstrated, developed, and evaluated technology for the abatement or prevention of water pollution from individual or multiple wastewater sources, by new or improved methods and techniques which have potential value for industry wide application where no methods exist or over existing methods employed.

In summary, to upgrade the state-of-art for the treatment of all industrial wastewaters.

2. Specific:
   a. Technical
      1. Define pre and post program state-of-art.
      2. Establish and maintain centers of excellence to assist in state-of-art maintenance.
      3. Develop cooperation of industry to maintain state of art.
      4. Develop technical, design and operational guides for each industrial waste of significance.
      5. Characterize industrial wastewaters and classify the pollutants into the four major categories of BOD, COD, TDS or SS.
      6. Develop comparable criteria for pollutional severity of contaminants.
      7. Establish relative severity of industrial wastewater pollutants in terms of total discharges.

b. Economic:
    1. Develop comparable basis for economic evaluation of industrial waste treatment.
    2. Determine pre and post program, economics of industrial wastewater treatment.
    3. Show that cost of adequate wastewater treatment will not exceed 2 to 4% of the total cost of industrial operations.

c. Demonstrate for each industry of significance:
    1. Feasibility of effective treatment (≧85% removal) systems
    2. Effective (≧85% removal) treatment systems within the following costs:

        for BOD removal = 13.5¢/1000 gal or = 1¢/lb BOD
        for COD " = 14¢/1000 gal or = 3¢/lb COD
        for TDS " = 15¢/1000 gal or = .05¢/lb TDS
        for SS " = 6¢/1000 gal or = 1¢/lb SS

    3. Least cost methods either directly or through inference from the results of program activities.
    4. By-produce recovery and wastewater reuse as feasible methods of pollution control.
    5. Total wastewater reuse and residue conversion to recover values.

ORGANIZATION

1. General: The organization of the 1200 program showing interrelationships of activities to meet objectives and goals is shown on page 1-11 and in Table VI. The outline form shows the program to consist of three major efforts, administrative, activities development, and implementation of projects.

ORGANIZATION OUTLINE

1. Administration
    - a. Centers of excellence
    - b. Activities Development
    - c. Implementation program

2. Activities Development
    - a. Centers of excellence
        - 1. Technical Information Activities
            - a. Wastewaters characterization
            - b. Criteria for pollutants comparability
            - c. Standards of performance
        - 2. Economic Bases
            - a. Demonstration Grants
            - b. Industry Wide Impact
    - b. State of Art
        - 1. Initial (by contract)
        - 2. Periodic (In-house)
        - 3. Terminal (In-house)
    - c. Cooperation of Industries
        - 1. Participation in implementation program (though grants and contracts)
        - 2. To develop wastewater treatment standard (In-house & with respective mfg. association)
        - 3. Maintain R&D implementation
        - 4. Disseminate information

3. Implementation Projects
    - a. Research
    - b. Development
    - c. Demonstration & Evaluation
    - d. Technical-Economics of Wastewater treatment processes

It should be apparent that extensive cooperation and communication among all participants and activities will be required.

The program is orientated to upgrade the state-of-art for industrial waste treatment to the extent that industries will thereafter continue to maintain the art in a progressive manner with minimum Federal R&D assistance. Therefore, it is imperative that the cooperation of industry be attained in the earliest phases of this program.

SCHEDULE AND MILESTONES

There are three major milestones to be demonstrated for each major industry category. Attainment of these milestones will provide an upgraded state-of-art for industrial wastewater treatment which will allow substantial decreased Federal R&D efforts to subside in favor of industry's own continued maintainence program.

The major milestones are:

1. Demonstration of the equivalence of secondary treatment for all industries of significance within each industrial category. The equivalence of secondary treatment is the removal of about 85% of the primary pollutants from industrial wastewaters. (Pollutants that can be removed by primary methods).

2. Development and demonstration of the necessary treatment requirements for industrial wastewaters of significance to the extent required to meet state and local water quality criteria. In a majority of cases this requirement can be attained by the removal of up to 98% of primary pollutants, or the removal to a high degree (85%) of secondary but significant contaminants from industrial wastewaters. (Pollutants that can be removed by secondary methods).

3. Develop and demonstrate the means to control all major pollutants from all industries.

SUMMARY

The research, development and demonstration program is directed toward developing the operational industrial waste treatment technology (1) that cannot be expected to be developed by industry and which is necessary to enable compliance with water quality standards, and (2) that is necessary to treat joint municipal-industrial wastes effectively. The largest part of this research will deal with the "innovative" treatment processes which are needed to supplement or substitute for conventional treatment processes. Research effort also will be directed toward developing the "near-100%" and "closed loop" waste treatment systems which are increasingly needed in areas of industrial congestion which, even with high levels of treatment, discharge enormous waste loads into limited reaches of water.

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ORD-1 12130 EOC	07/69	"Joint Muncipal & Semichemical Pulping Waste Treatment." City of Erie, PA., Hammermill Paper Company, WPRD 223-01-68.
ORD-2 12120 ERC	08/69	"Disposal of Wastes from Water Treatment Plants." American Water Works Association Research Foundation, WP 1535-01-69.
ORD-5 12120 ---	08/69	"Activated Sludge Treatment of Chrome Tannery Wastes." A. C. Lawrence Leather Company, WPRD 133-01-68.
DAST-3 12040 EUG	10/69	"Foam Separation of Kraft Pulping Wastes." Georgia Kraft Company, WPRD 117-01-68.
DAST-8 12060 FAD	10/69	"Aerobic Treatment of Fruit Processing Wastes." Snokist Growers, Inc., WPRD 58-01-68.
DAST-14 12060 ---	10/69	"Current Practice in Potato Processing Waste Treatment." University of Washington, WP 01486.
12010 EZV	02/70	"Treatment of Waste Water-Waste Oil Mixtures." Armco Steel Corporation, WPRD 169-01-68.
12020 ---	02/70	"Petrochemical Effluents Treatment Practices-Summary." Engineering Science, Inc., 14-12-461.
12040 EZZ	04/70	"Dilute Spent Kraft Liquor Filtration Through Wood Chips." University of North Carolina, WPRD 115-01-68.

TABLE I. ESTIMATED VOLUME OF INDUSTRIAL WASTES BEFORE TREATMENT, 1963

PPB Code	SIC[4] Code	Industry Group(s)	Total [7] Waste-water, billion gal.	Process Water Intake-Billion gallons	Standard Bio-Chem. Oxygen Demand Million	Settleable and Suspendes Solids, Million pounds
1201	33,34	Metal & Metal Products	>4,300	1,000	>480	>4,700
1202	28	Chemical & Allied Products	3,700	560	9,700	1,900
1203	—	Power Production	(NA) [5]	N.A.[5]	N.A.[5]	N.A.[5]
1204	26	Paper & Allied Products	1,900	1,300	5,900	3,000
1205	29	Petroleum & Coal	1,300	88	500	460
1206	20	Food & Kindred Products	690	260	4,300	6,600
1207	35,36,37	Machinery & Transportation Equip.	≥481	109	≥250	>70
1208	32	Stone, Clay, and Glass Products	(218) [6]	88	N.A.	N.A.
1209	22	Textile Mill Products	140	110	890	N.A.
1210	24,25	Lumber & Wood Products	(126) [6]	57	N.A.	N.A.
1211	30	Rubber & Plastics	160	19	40	50
1212	12,19,21,27 31,38,39,72	Miscellaneous Industrial Sources	450	190	>390	>930
1200		All Manufacturing	≧13,100	≧3,700	≧22,000	≧18,000
		For Comparison: sewered population of U. S.	5,300 [1]	N.A.	7,300	8,800 [3]

[1] 120,000,000 persons x 120 gallons x 365 days
[2] 120,000,000 persons x 1/6 pounds x 365 days
[3] 120,000,000 persons x 0.2 pounds x 365 days

[4] Standard Industrial Classification
[5] Not Available or Not Applicable
[6] Included in Total for All Mfg.

[7] Includes cooling water and Steam production waters.

(1) Ref: Volume II - The Cost of Clean Waters. 1968.

TABLE II*
WASTEWATER CHARACTERISTICS AND POLLUTANTS OF SELECTED INDUSTRY GROUPS

SIC CODE		201	203		22	26	281	282		2911	3111	331	3334	3722
Liquid Waste Characteristic	Domestic	Meat Products	Canned & Frozen Foods	Sugar	Textile Mill Products	Paper & Allied Products	Basic Chemicals	Fibers Plastics & Rubbers	Fertilizer	Petroleum Refining	Leather Tanning & Finishing	Steel Rolling & Finishing	Primary Aluminum	Motor Vehicles & Parts
UNIT VOLUMES	x	x	x	x	x	x	x	x	x	x	x	x	x	x
pH		x		x	x	x	x	x	x	x	x	x	x	x
ACIDITY		x		x			x		x	x	x	x	x	
ALKALINITY				x	x	x	x			x	x	x		x
COLOR					x	x	x	x		x	x			x
ODOR					x		x	x		x				x
TOTAL SOLIDS		x		x	x	x	x	x	x		x	x	x	x
SUSPENDED SOLIDS	x	x	x	x	x	x	x	x		x	x	x		x
TEMPERATURE		x				x	x	x	x			x		x
BOD5/BOD ultimate	x	x	x	x	x	x	x	x		x	x	x		x
COD	x						x	x		x		x		x
OIL & GREASE		x		x	x	x	x	x		x		x		x
DETERGENTS (Surfactants)	x				x	x	x	x						x
CHLORIDE		x				x	x	x		x	x	x		x
HEAVY METALS														
Cadmium							x							x
Chromium					x		x				x			x
Copper					x		x							x
Iron							x			x		x		x
Lead							x							x
Manganese							x			x				x
Nickel							x							x
Zinc					x		x							x
NITROGEN				+										
Ammonia		x			x	x	x		x	x	x	x		
Nitrate					x		x							
Nitrite					x		x							
Organic		x		x		x	x			x	x			
Total		x			x	x	x		x		x			
PHOSPHORUS		x					x		x					
PHENOLS					x		x	x		x		x		x
SULFIDE					x	x	x			x	x	x		
TURBIDITY	x				x		x			x				
SULFATE					x	x	x	x		x	x			
THIOSULFATE					x		x							
MERCAPTANS						x	x			x				
LIGININS						x								
SULFUR						x	x							
PHOSPHATES						x	x		x					
POTASSIUM						x	x			x				
CALCIUM						x	x			x				
POLYSACCHARIDES						x	x							
TANNIN						x					x			
SODIUM						x	x			x	x			
FLUORIDES							x		x	x		x	x	
SILICA							x		x					x
TOXICITY					x		x	x						
MAGNESIUM										x				
AMMONIA							x		x	x		x		
CYANIDE							x				x	x		x
THIOCYANATE							x					x		
FERROUS IRON						x	x					x		
SULFITE							x							
ALUMINUM							x							

*Ref: Volume II - The Cost of Clean Waters 1962

TABLE III

Comparative Pollution Index Based on Surface Water Criteria for Public Water Supplies

Constituent or characteristic	Permissible Criteria	Relative Criteria	Paragraph
Physical:			
Color (color units)	75		1
Odor	Narrative		2
Temperature*	do		3
Turbidity	do		4
Microbiological:			
Coliform organisms	10,000/100 ml[1]		5
Fecal coliforms	2,000/100 ml[1]		5
	(mg/l)		
Inorganic chemicals:			
Alkalinity	Narrative		6
Ammonia	0.5 (as N)	0.1	7
Arsenic*	0.05	0.01	8
Barium	1.0	0.2	8
Boron*	1.0		9
Cadmium*	0.01		8
Chloride*	250	50	8
Chromium*, hexavalent	0.05		8
Copper*	1.0		8
Dissolved oxygen	≥4 (monthly mean) ≥3 (individual sample)		10
Fluoride*	Narrative		11
Hardness*	do		12
Iron (filterable)	0.3		8
Lead*	0.05	.01	8
Manganese* (filterable)	0.05	.01	8
Nitrates plus nitrites*	10 (as N)		13
pH (range)	6.0–8.5		14
Phosphorus*	Narrative		15
Selenium*	0.01		8
Silver	0.05		8
Sulfate*	250	50	8
Total dissolved solids* (filterable residue).	500	100	16
Uranyl ion*	5	1	17
Zinc*	5	1	8
Organic chemicals:			
Carbon chloroform extract* (CCE)	0.15		18
Cyanide*	0.20		8
Methylene blue active substances*	0.5		
Oil and grease*	Virtually absent		20
Pesticides:			
Aldrin*	0.017		21
Chlordane*	0.003		21
DDT*	0.042		21
Dieldrin*	0.017		21
Endrin*	0.001	.0002	21
Heptachlor*	0.018		21
Heptachlor epoxide*	0.018		21
Lindane*	0.056		21
Methoxychlor*	0.035		21
Organic phosphates plus carbamates.*	0.1[2]		21
Toxaphene*	0.005		8
Herbicides:			
2,4D plus 2,4,5-T plus 2,4,5-TP*	0.1	.02	21
Phenols*	0.001	.0002	8
	(pc/l)		
Radioactivity:			
Gross beta*	1,000		8
Radium-226*	3		8
Strontium-90	10(4)		8
BOD	5	1	

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* The defined treatment process has little effect on this consituent.

(1) Microbiological limits are monthly arithmetic averages based upon an adequate number of samples. Total coliform limit may be relaxed if fecal coliform concentration does not exceed the specified limit.

(2) As parathion in cholinesterase inhibition. It may be necessary to resort to even lower concentrations for some compounds or mixtures. See Paragraph 21.

(3) All relative to BOD

(4) Max. value found in tap water analysis of 20 communities

(5) Report of the Committee on Water Quality Criteria. April 1, 1968

TABLE IV

STANDARD INDUSTRIAL CLASSIFICATION OF
INDUSTRIES OF SIGNIFICANCE FOR WATER POLLTUION

CODE	FOOD AND KINDRED PRODUCTS
201	Meat products
2011	Meat slughtering plants
2013	Meat processing plants
2013	Meat processing plants
2015	Poultry dressing plants
202	Dairies
2021	Creamery butter
2021	Creamery butter
2022	Natural and precess cheese
2023	Condensed and evaporated milk
2026	Fluid milk
203	Canned and frozen foods
2033	Canned fruits and vegetables
2034	Dehydrated foods products
2035	Pickles, sauces, salad dressings
2037	Frozen fruits and vegetables
204	Grain mills
2041	Flour mills
2043	Cereal preparations
2046	Wet corn milling
205	Bakery products
206	Sugar
207	Candy and related products
208	Beverages
2082	Malt liquors
2084	Wines and bt brandy
2085	Distilled liquor.
2086	Soft drinks
209	Miscellaneous foods and kindred products
2091	Cottonseed oil mills
2092	Soybean oil mills
2094	Animal and marine fats and oils
2096	Shortening and cooking oils
	TEXTILE MILL PRODUCTS
2211	Weaving mills, cotton
2221	Weaving mills, synthetice
2231	Weaving, finishing mills, wool
225	Knitting mills
226	Textile finishing, except wool
228	Yarn and thread mills
229	Miscellaneous textile goods
24	LUMBER AND WOOD PRODUCTS
242	Sawmills and planning mills
2421	Sawmills and planning mills

CODE	
26	PAPER AND ALLIED PRODUCTS
2611	Pulp mills
2621	Paper mills, except building
2631	Paperboard mills
264	Paper and paperboard products
265	Paperboard containers and boxes
2661	Building paper and board mills
28	CHEMICALS AND ALLIED PRODUCTS
281	Basic chemicals
2812	Alkalies and chlorine
2818	Organic chemicals, n.e.c.
2819	Inorganic chemicals, n.e.c.
282	Fibers, plastics, rubbers
2821	Plastics materials & resins
2823	Cellulosic man-made fibers
2824	Organic fibers, noncelluiosic
283	Drugs
284	Cleaning and toilet goods
2851	Paints and allied products
2861	Gum and wood chemicals
287	Agricultural chemicals
289	Miscellaneous chemical products
29	PETROLEUM AND COAL PRODUCTS
2911	Petroleum refining
295	Paving and roofing materials
30	RUBBER AND PLASTICS PRODUCTS, n.e.c.
3069	Rubber products, n.e.c.
3079	Plastics products, n.e.c.
31	LEATHER AND LEATHER PRODUCTS
3111	Leather tanning and finishing
32	STONE, CLAY, AND GLASS PRODUCTS
3211	Flat glass
3341	Cement, hydraulic
325	Structural clay products
326	Pottery and related products
327	Concrete and plaster products
3281	Cut stone and stone products
329	Nometallic mineral products
33	PRIMARY METAL INDUSTRIES
331	Steel rolling and finishing
332	Iron and steel foundries
333	Primary nonferrous metal
3341	Secondary nonferrous metals

TABLE V

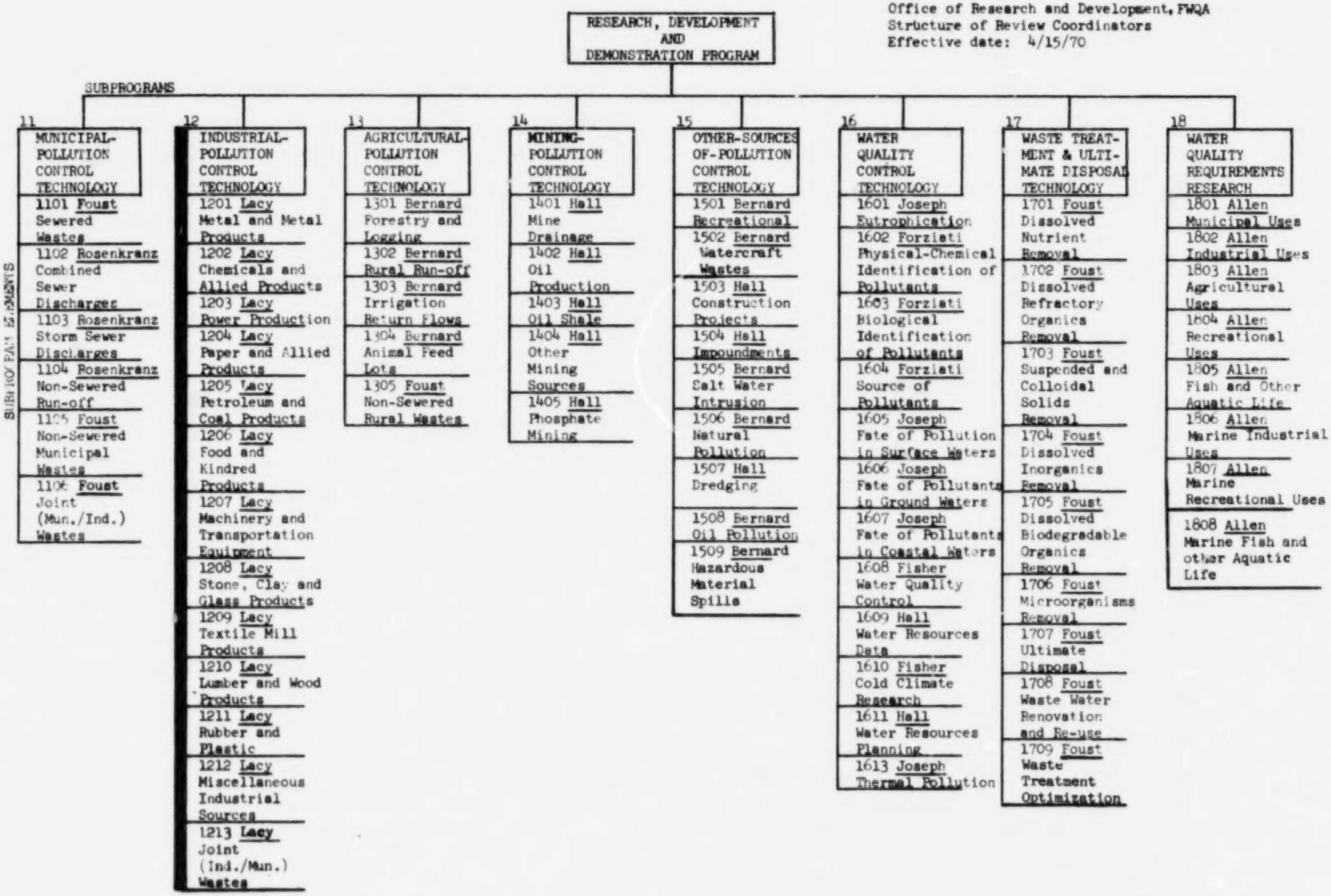
SOURCES OF POLLUTION NATIONAL PRIORITIES*

No.	Source	Priority	PPB Category
1	Pulp & paper industry	1	1204
2	Municipal sewered waste	2	1101
3	Power (thermal) production	3	1203
4	Agriculture run-off	4	1302
5	Storm & combined sewers	5	1102 1103
6	Food processing industry	6	1206
7	Petrochemical industry	7	1202
8	Irrigation return flow	8	1303
9	Petroleum refining industry	9	1205
10	Feed lots	10	1304
11	Metal & metal products industry	11	1201
12	Unsewered domestic waste	12	1106
13	Marina	13	1501
14	Dredging	14	1507
15	Oil pollution & production	14	1402
16	Organic chemical industry	14	1202
17	Acid Mines	15	1401
18	Impoundments	16	1604
19	Recreation boats	16	1501
20	Unsewered urban run-off	17	1104
21	Textile industry	18	1209
22	Inorganic chemical industry	19	1202
23	Commercial vessels	20	1502
24	Construction activities	21	1603
25	Potato processing	22	1208
26	Pharmaceutical manufacture	23	1202
27	Pesticide industry	24	1202
28	Saltwater intrusion	25	1505
29	Phosphate mining	26	1404
30	Logging	27	1301
31	Milk products & handling	28	1208
32	Fertilizer manufacture	29	
33	Fish processing industry	30	1208
34	Lumbering	31	1210
35	Mining	32	1404
36	Coal processing	33	1205
37	Strip mining (coal, sand & gravel)	34	1404
38	Uranium mining	35	1403
39	Meat packing	35	1208
40	Natural pollution	36	1506
41	Canning industry	37	1208
42	Sugar beet industry	37	1208
43	Cattle industry	37	1304
44	Brines	38	1212
45	Copper mining	39	1404
46	Log storage	38	1210
47	Agricultural chemical production	40	1202
48	Tanning & leather industry	41	1212
49	Nuclear installations	41	1212
50	Brewery wastes	42	1208

*Developed 1967-1968

TABLE VI

Office of Research and Development, FWQA
Structure of Review Coordinators
Effective date: 4/15/70



RESEARCH, DEVELOPMENT AND DEMONSTRATION PROGRAM

SUBPROGRAMS

SUBPROGRAM ELEMENTS

- 11 MUNICIPAL-POLLUTION CONTROL TECHNOLOGY
  - 1101 Foust Sewered Wastes
  - 1102 Rosenkranz Combined Sewer Discharges
  - 1103 Rosenkranz Storm Sewer Discharges
  - 1104 Rosenkranz Non-Sewered Run-off
  - 1105 Foust Non-Sewered Municipal Wastes
  - 1106 Foust Joint (Mun./Ind.) Wastes
- 12 INDUSTRIAL-POLLUTION CONTROL TECHNOLOGY
  - 1201 Lacy Metal and Metal Products
  - 1202 Lacy Chemicals and Allied Products
  - 1203 Lacy Power Production
  - 1204 Lacy Paper and Allied Products
  - 1205 Lacy Petroleum and Coal Products
  - 1206 Lacy Food and Kindred Products
  - 1207 Lacy Machinery and Transportation Equipment
  - 1208 Lacy Stone, Clay and Glass Products
  - 1209 Lacy Textile Mill Products
  - 1210 Lacy Lumber and Wood Products
  - 1211 Lacy Rubber and Plastic
  - 1212 Lacy Miscellaneous Industrial Sources
  - 1213 Lacy Joint (Ind./Mun.) Wastes
- 13 AGRICULTURAL-POLLUTION CONTROL TECHNOLOGY
  - 1301 Bernard Forestry and Logging
  - 1302 Bernard Rural Run-off
  - 1303 Bernard Irrigation Return Flows
  - 1304 Bernard Animal Feed Lots
  - 1305 Foust Non-Sewered Rural Wastes
- 14 MINING-POLLUTION CONTROL TECHNOLOGY
  - 1401 Hall Mine Drainage
  - 1402 Hall Oil Production
  - 1403 Hall Oil Shale
  - 1404 Hall Other Mining Sources
  - 1405 Hall Phosphate Mining
- 15 OTHER-SOURCES OF-POLLUTION CONTROL TECHNOLOGY
  - 1501 Bernard Recreational
  - 1502 Bernard Watercraft Wastes
  - 1503 Hall Construction Projects
  - 1504 Hall Impoundments
  - 1505 Bernard Salt Water Intrusion
  - 1506 Bernard Natural Pollution
  - 1507 Hall Dredging
  - 1508 Bernard Oil Pollution
  - 1509 Bernard Hazardous Material Spills
- 16 WATER QUALITY CONTROL TECHNOLOGY
  - 1601 Joseph Eutrophication
  - 1602 Forziati Physical-Chemical Identification of Pollutants
  - 1603 Forziati Biological Identification of Pollutants
  - 1604 Forziati Source of Pollutants
  - 1605 Joseph Fate of Pollution in Surface Waters
  - 1606 Joseph Fate of Pollutants in Ground Waters
  - 1607 Joseph Fate of Pollutants in Coastal Waters
  - 1608 Fisher Water Quality Control
  - 1609 Hall Water Resources Data
  - 1610 Fisher Cold Climate Research
  - 1611 Hall Water Resources Planning
  - 1613 Joseph Thermal Pollution
- 17 WASTE TREATMENT & ULTIMATE DISPOSAL TECHNOLOGY
  - 1701 Foust Dissolved Nutrient Removal
  - 1702 Foust Dissolved Refractory Organics Removal
  - 1703 Foust Suspended and Colloidal Solids Removal
  - 1704 Foust Dissolved Inorganics Removal
  - 1705 Foust Dissolved Biodegradable Organics Removal
  - 1706 Foust Microorganisms Removal
  - 1707 Foust Ultimate Disposal
  - 1708 Foust Waste Water Renovation and Re-use
  - 1709 Foust Waste Treatment Optimization
- 18 WATER QUALITY REQUIREMENTS RESEARCH
  - 1801 Allen Municipal Uses
  - 1802 Allen Industrial Uses
  - 1803 Allen Agricultural Uses
  - 1804 Allen Recreational Uses
  - 1805 Allen Fish and Other Aquatic Life
  - 1806 Allen Marine Industrial Uses
  - 1807 Allen Marine Recreational Uses
  - 1808 Allen Marine Fish and other Aquatic Life

TABLE VII

POLLUTION CONTROL PROGRAM SUMMARY

Pollution Control Program	Cost for Pollution Abatement by 1973 - Billions of Dollars				Relative Gross Pollution Load	Present Gross Load Treated	Relative Wastewater	Waste Type	Projected Total Water Use Increase
	Current Cap. Inv.	Required Cap. Inv. 67 - 73	O&M 67 – 73	Total	(BOD) Basis	(1962 - 64)	Volume		(% change 1954 - 2000)
Industrial Pollution Control	2.4 - 2.9	2.5 - 4.5	3 - 3.9 (.35 - .43 in 67)	5.5 - 8.4	3.0(6)	≈ 35%	0.71 (process waters only) (.18 jointly)	All types	716
Municipal (1) Pollution Control	≈ 40	8 - 8.7	1.4 - 1.7 (.2 in 67)	9.4 - 10.4	1.0(7)	≈ 40%	1.0	Primarily	238
Combined Sewer and Storm Overflow Control	≥ 60 (for waste collection system)	6.2 (2) 25(3) 49(4)	NA NA NA	≥ 6.2 ≥ 25 ≥ 49	= 0.4 = 0.1 (8)	≈ 60% NA(5)	0.1 for overflows	Domestic	238

(1) Includes Joint Treatment

(2) For Sanitary Sewers

(3) Storm Sewer Requirements for Urban Areas

(4) Complete Separation of Combined Sewers into Sanitary and Storm Sewers

(5) Not Applicable or Available

(6) Currently Jointly Treated

(7) Based on 120 Million Sewered Population

(8) For Overflows of Combined Systems

TABLE VIII

Total current value of waste treatment requirements of major industrial establishment*

Industry	Fiscal 1969 estimate	Fiscal 1972 By Census projection
Food and kindred products	740	670
Textile mill products	170	170
Paper and allied products	320	920
Chemical and allied products	380	1000
Petroleum and coal	380	270
Rubber and plastics	41	59
Primary metals	1500	1400
Machinery	39	56
Electrical machinery	36	51
Transportation equipment	220	160
All other manufacturing	200	290
Total capital requirement	4000	5000
Plant currently provided:		
By industry	2200	1800
Through municipal facilities	730	640
Current backlog	1100	2600

* Assuming at least 85% reduction of standard biochemical oxygen demand (determined according to the five- day test) and of settleable and suspended solids.

** All values rounded to two significant figures; constant dollars.

† Based upon Industrial Waste Profiles in Volume III of the report.

†† Based upon Census of Manufacturers data and established treatment cost factors.

TABLE IX

Unit Operations and Processes Applicable to Treatment and Control of Industrial Water Pollution

	Dissolved Nutrient Removal	Dissolved Refractory Organics Removal	Suspended & Colloidal Solids Removal	Dissolved Inorganics Removal	Dissolved B.O.D. Removal	Micro-organisms Removal	Concentrate Removal
Activated Sludge	--	--	x	--	x	x	--
Air Stripping	x	x	x	--	x	--	--
Bio-Denitrification	x	L	--	--	L	--	--
Bio-Filters	x	--	--	--	x	--	--
Bio-Nitrification	--	--	x	--	x	--	--
Biomass Treatment (Algae Harvesting)	x	--	--	--	x	--	x
Biological PO_4 Removal	x	--	--	--	x	--	--
Chemical Oxidation	--	x	--	--	x	x	--
Chemical Precipitation	x	x	--	x	--	--	--
Chemical Reduction	x	--	--	--	--	--	--
Coagulation-Polyelectrolytes	--	--	x	--	x	x	--
Coagulation-Sedimentation (Inorganic)	x	--	x	--	x	x	--
Coal Filtration	--	--	x	--	L	x	--
Combined Chemical-Biological Treatment	x	--	x	--	x	x	--
Diatomaceous Earth Filtration	--	--	x	--	--	x	--
Disinfection	--	--	--	--	--	x	--
Distillation	x	x	x	x	x	x	--
Dual-Media Filtration	--	--	x	--	--	x	--
Electrodialysis	x	--	--	x	--	x	--
Electrolytic Treatment	x	x	--	--	x	x	--
Extraction	x	x	--	x	--	--	--
Fluidize Bed Incineration	--	x	x	--	x	x	x
Foam Separation	--	x	x	x	--	--	--
Freezing	x	x	--	x	x	--	--
Gas Hydration	x	x	--	x	x	--	--
Granular Activated Carbon Adsorption	--	x	--	--	x	--	--
Ion Exchange	x	--	--	x	--	--	--
Lime Recalcination	--	--	--	--	--	--	x
Micro-Screening	--	--	x	--	--	x	--
Oxidation Ditch	--	--	x	--	x	x	--
Ozonation	--	x	--	--	L	x	--
Powdered Carbon Adsorption	--	x	x	--	x	x	--
Reverse Osmosis	x	x	x	x	x	x	--
Sand Filtration	--	--	x	--	--	x	--

L = Under specific conditions there will be limited effectiveness.

TABLE X

PROPOSAL EVALUATION CRITERIA

1. Extent of industry-wide applicability of results.

2. The extent the proposed work can be considered as a new or improved method of pollution control.

3. The amount of risk involved, i.e. the probability of success.

4. The long range benefits to be derived by the grantee.

   a. Research - minimum grantee benefits - maximum % support by FWQA.
   b. Development - partial grantee benefits - partial % support by FWQA.
   c. Demonstration - maximum grantee benefits - minimum % support by FWQA.

5. The extent to which the project will provide solutions to the national pollution problem.

6. The capability of the grantee for promoting broad application of results of a successful project. (e.g. Nation.Assoc. Sponsorship)

7. Thoroughness of work plan, qualifications of project director and support personnel, facilities available, testing and analysis.

8. The extent of outside interest expressed - particularly in dollar support.

9. Reasonableness of the costs proposed.

10. For proposals qualifying for FWQA support, based on the above, the distribution of FWQA participation is allocated in a manner to provide appropriate administrative and fiscal control of the project during its course. This is accomplished by allowing greater FWQA contributions toward the technical requirements (i.e. engr. services), lesser percentage contributions toward operational requirements (i.e. O&M costs), and minimum percentage contribution toward capital items (i.e. equipment and construction).

TABLE XI

SPECIAL-PURPOSE RESEARCH ASSINGMENTS

FOR FIELD LABORATORIES

Laboratory	
Robert S. Kerr Water Research Center Ada, Okalhoma Wm. C. Galegar Director	Treatment and Control Research- Experimental application of technology for treatment, control, or prevention of pollution from: (1) petrochemical industry (2) oil production (3) petroleum refining (4) irrigation return flows (5) impoundments
	Water Quality Control Research- Development of technology for control of pollution by means other than waste treatment (e.g., process change, dillution, dispersion, environmental treatment, etc.)
	Ground Water Pollution Research- Research on fate of pollution in ground water, ultimate disposal of waste concetrates under the ground, soil treatment, soil chemistry and micorbiology and ground water recharge.
Southeast Water Laboratory Athens, Georgia D. W. Dutweiler Director	Treatment and Control Research- Experimental application of technology for treatment, control, or prevention of pollution from: (1) agriculture run-off (2) pesticide manufacture (3) fertilizer manufacture (4) phosphate mining (5) textile mills (6) chicken processing
	Pollution Identification Research- Research on physical and chemical analytical methods for detecting, measuring, characterizing and indicating pollution.

TABLE XI (continued)

Laboratory	Research Assignments
Athens, Georgia (cont'd)	Pollution Source and Fate Research- Research on methods for identifying and measuring sources of pollution and on fate of pollution in streams and lakes.
Robert A. Taft Water Research Center Cincinnati, Ohio F. M. Middleton Director	Municipal Waste Treatment Research- Experimental application of technology for treatment, control, or prevention of pollution from: (1) municipal sewers (2) unsewered homes
	Physical-Chemical Treatment Research- Development of technology for physical-chemical separation, modification, or destruction of impurities in wastewaters.
	Biological Treatment Research- Development of technology for biological separation, modification, or destruction of impurities in wastewaters.
	Ultimate Disposal Research- Development of technology for the non-pollutional disposal of waste concentrates except disposal under the ground.
Alaska Water Lab. College Alaska R. W. Lattimer Director	Treatment and Control Research- Experimental application of technology for treatment, control, or prevention of pollution from: (1) fish processing (2) copper mining
	Cold Climate Research- Research on pollution in the Arctic environment.
Pacific Northwest Water Laboratory Corvallis, Oregon A. F. Bartsch Director	Treatment and Control Research- Experimental application of technology for treatment, control, or prevention of pollution from: (1) power production (thermal pollution) (2) potato processing (3) pulp and paper manufacture (4) lumber mills (5) logging operations

TABLE XI (continued)

Laboratory	Research Assingnments
Corvallis, Oregon (cont'd)	Eutrophication Research- Development of technology for the control and prevention of accelerated eutrophication. Coastal Pollution Research- Research on fate of pollution in estuarial and coastal waters.
National Water Quality Laboratory Duluth, Minnesota D. I. Mount, Director	Fresh Water Quality Requirements Research- Determination of physical, chemical, and biological water quality requirements for all fresh water uses—municipal, industrial, agricultural, recreational, and for propagation offish, other aquatic life and wildlife.
National Marine Water Quality Laboratory West Kingston, R.I. Clarence Tarzwell Director	Marine Water Quality Requirements Research- Determination of physical, chemical, and biological water quality requirements for all marine water uses — industrial, recreational, and for propagation of fish, other aquatic life and wildlife.

TABLE XII

Major Work Needs
Research, Development & Demonstration 1200 Area

Area PPB		Identifying Title
1202		Joint treatment of organic & inorganic chemical wastes; limitations, guidelines
1205	CLK	Bio treatment of refinery waste with reuse & pre/post phenol removal
1209	CKU	Treatment of textile mill finishing, sizing, and dye wastes
1203	CKT	Removal of biocides from cooling tower blowdown, multiple use of, & limitations on use of cooling towers for pollution control
1206	CKS	Treatment of Seafoof Processing waste with by-product recovery
1212	CKR	Treatment and disposal of secondary type sludges
1202		Ozonation of Phenols and Cyanide
1202		Permanganage treatment and Scavenging
1202		Closed loop system in a Pharmaceutical Plant
1204	CKQ	Paper Mill "White Water" treatment
1202	CLN	Techniques for treatment of Pesticides and Chlorophenolic Wastes
1202		Thermal Oxidation of refractory Organic Waste
1202		Nitrate and Nitric Acid Plant Effluent Denitrification
1201	CKP	Ammonia water treatment by Ion Exchange
1210	CKD	Wood Extracts and Allied Products waste streams
1204	CKN	Color Removal from Ink Plant Effluents
1206	CKM	Membrane treatment techniques for Dairy Waste, Plating, and High value wastes
1206	CKL	Rum Distillary and Sugar Cane Processing Waste
1202	CLV	Acid and Alkali Neutralization by Bio-Carbonation
1206	CKK	Techniques for treating Poultry Processing Waste including water reuse
1212	CKZ	Deep well disposal limitations and guidelines for industrial wastes
1206	CKJ	Paunch Manure Conversion Processing
1212	CKK	Laundry Waste Water Treatment
1204	CKI	Sulfite Liquor Treatment System
1204	CKH	Paperboard Water Reuse Process
1212	CKG	Secondary treatment of Tannery Waste Water

TABLE XII (continued)

1204		Reclaim Lime From Color Removal of Kraft Efflents
1209	CJG	Finishing Mill Waste waters
1212	CJP	Tobacco Plant Wastes
1208	CJE	Sand Gravel Washings
1211	CJD	Plastic-Products Discharges
1202		Pesticide Concentrates Incineration
1201		Metals recovery from metal finishing waste treatment sludges
1202	CLQ	Fertilizer Plant Effluents
1208	CJC	Cement Water Turbidity Removal
1202	CLJ	Refractory Org. Thermal Oxidation
1205	CLM	Tar Products Waste Treatment
1206	CJA	Treatment of Canning Brines
1206	CIZ	State of the Art Beverage Industry
1204	CIY	Close system for a Reclaim Paper Mill
1206	CIX	Application of the Rotating Biological Disc to Food Industry Wastes
1202	CLS	Model total waste water recovery & reuse - chem. ind.
1202	CLL	Anaerobic-Aerobic Process Development for Organic Chemical Wastes
1202	CLT	Recovery & Reuse of Organic Chemicals from Waste water
1206		Rice and Coffee precessing waste treatment
1206		Soybean processing waste treatment by reverse osmosis with water reuse
1201		Electrochemical Destruction of cyanide in a waste stream
1208		Treatment and Recovery of Waste Water from the Granit Industry
1213		Optimization of Combined Industrial-Municipal Waste thru automation and reuse
1213		Multiple Biological treatment of combined Industrial-Municipal Wastes
1213		Joint treatment including Bio-Physical techniques with water reuse by industry
1213		Treatment & Reuse of Combined Chemical-Domestic Waste
1213		Treatment and Inplant reuse of Combined Synthetic Rubber Plant and Municipal Waste
1201		Demonstration of Coke Plant Waste Treatment with ammonia removal and water reuse
1201		Ammonia destruction, product conversion and/or reuse
1201		Thermal Regneration of Hydrchloric acid pickle liquors with water reuse
1201		Closed Loop Electomembrane Process for sulphuric acid pickle liquors
1201		Cyanide recovery from plating sollutions
1201		Product recovery and water reuse from spent Nitric-Hydrofluoric acid pickle liquors

TABLE XII (continued)

1201	CKF	Coke Plant Gas Scrubber System Water Reuse
1205	CLU	Demonstration of Fiberous Bed Coalescers on Refinery Waste
1201	CKE	Continuous ion exchange bed treatment for Recovery & Reuse Steel Mill Pickle Waste
1211	CKW	Synthetic Rubber Plant Waste Treatment System with Water Reuse
1211	CKV	Synthetic Resins Plant Waste Treatment System
1206	CKD	Full Scale development on recovery of food processing brines
1206	CKC	Anaerobic thermophilic filtration of cannery wastes
1206	CKB	Improved Biological Treatment cannery wastes - Bio Contactor etc.
1206	CKA	Regional collection system for whey treatment & recovery
1202		Treatment and Reuse of Fertilizer Plant Waste Water
1206	CJY	Regional Collection System, Ind. Waste Treatment
1206	CJX	Improve protein recovery system in fish, dairy & Meat, milling industries
1206		Dry Caustic Peel of Fruits
1206	CJV	Improved grease recovery systems - edible oil industry
1209	CJU	Solvent Processing of Wool
1206	CJT	Treatment of High BOD Beverage Industry waste
1206	CJS	Biotreatment of Dairy Waste
1202	CLP	Recovery of Organic Chemicals from Waste
1202		Elim. Discharge of Water Softner Brines
1205	CJR	Biotreatment & Coolant water reuse
1209	CJQ	Carpet Mill Dye Waste Water Treatment
1202	CLR	Deep well chemical Disposal
1212	CJP	Tannery Sludge Stabilization
1212		Film Mfg. Water Renovation
1204	CJD	Stream Stripping Kraft Efflents
1202		Paint and Allied Products Water Treatment
1204	CJN	Microstraining for Solids Removal
1202		Detergent Mfg Effluent treatment
1202		Explosive Mfg. Effuent Treatment by Reverse Osmosis, with Water Reuse
1204	CJM	Biological Slude Disposal
1207	CJL	Reclamation of Oils
1202	CLO	Miscellaneous.Chemcials waste water treatment
1209	CJK	Weaving Mill Dye Wastes
1208	CJJ	Coagulation of Tile Mfg. Waters
1212	CKY	Film Processing Chemicals Wastes
1204	CJI	Chemical Utlization of Sulfite Liquor

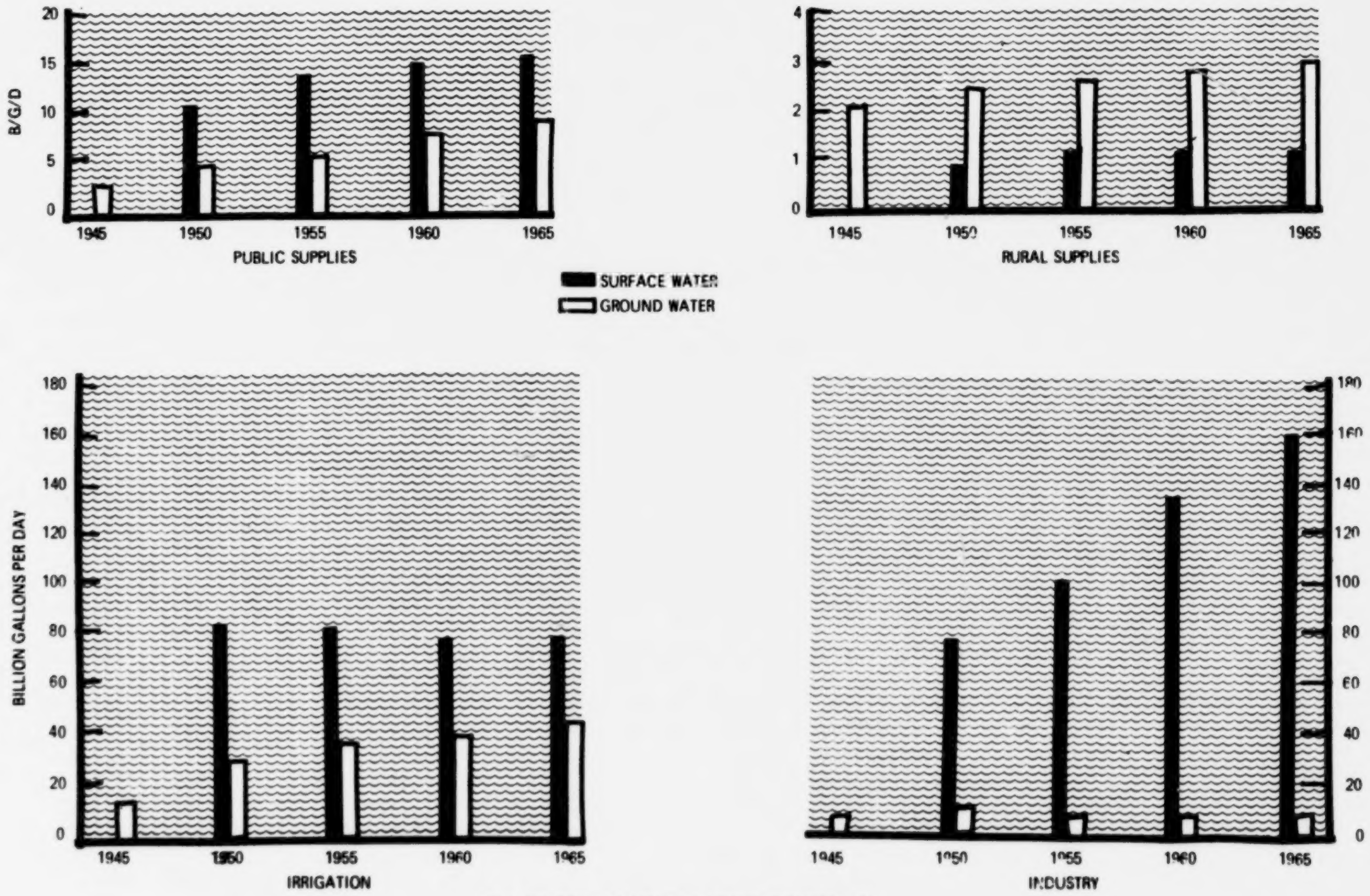


FIG 1. TRENDS IN USE OF WATER FOR PUBLIC SUPPLIES, RURAL SUPPLIES, IRRIGATION, AND INDUSTRY, 1945-65

Note: Surface-water data for 1945 not available.

INDUSTRIAL POLLUTION CONTROL BRANCH PROJECTS

FIGURE II
"Dollar Value of Projects"

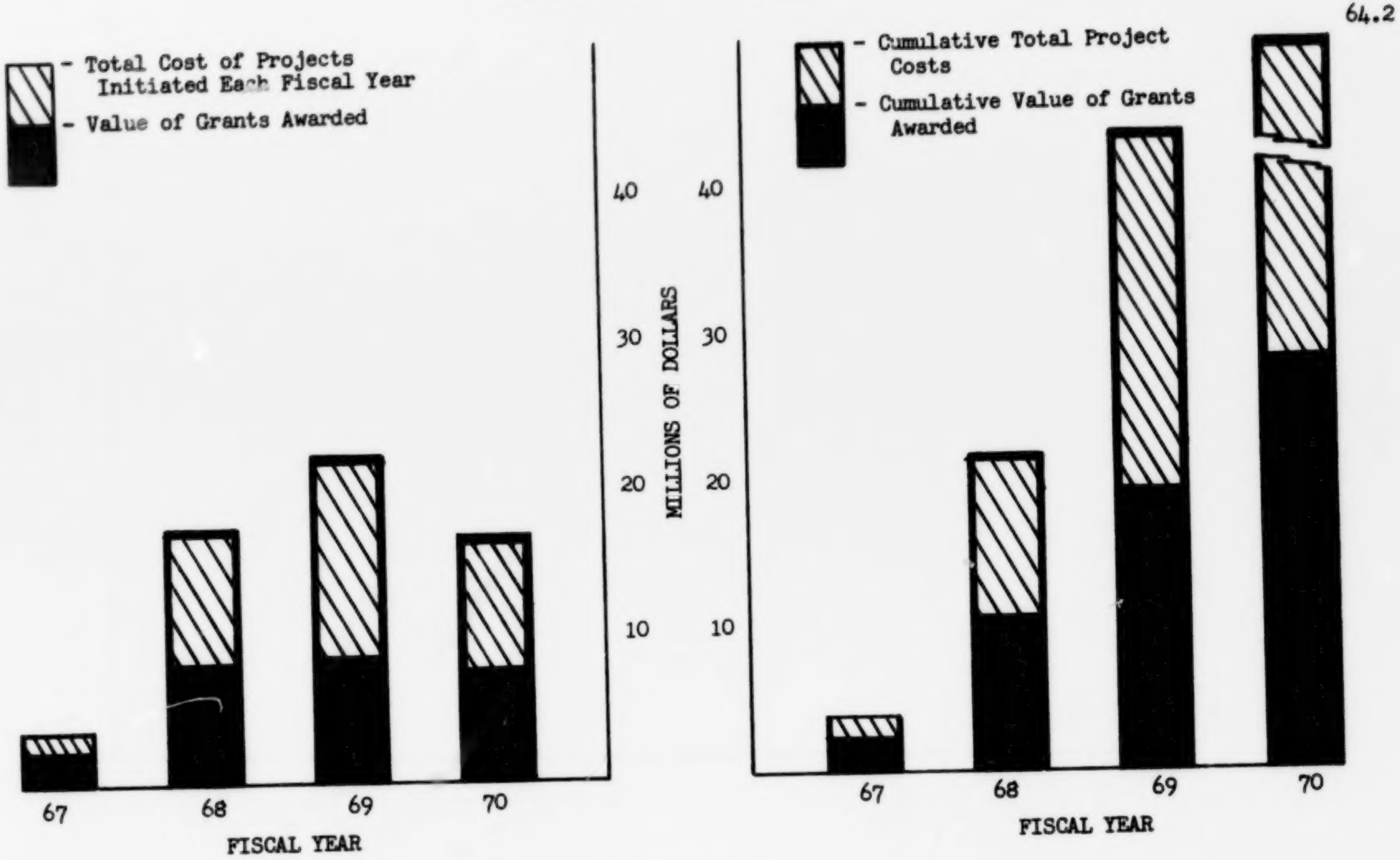
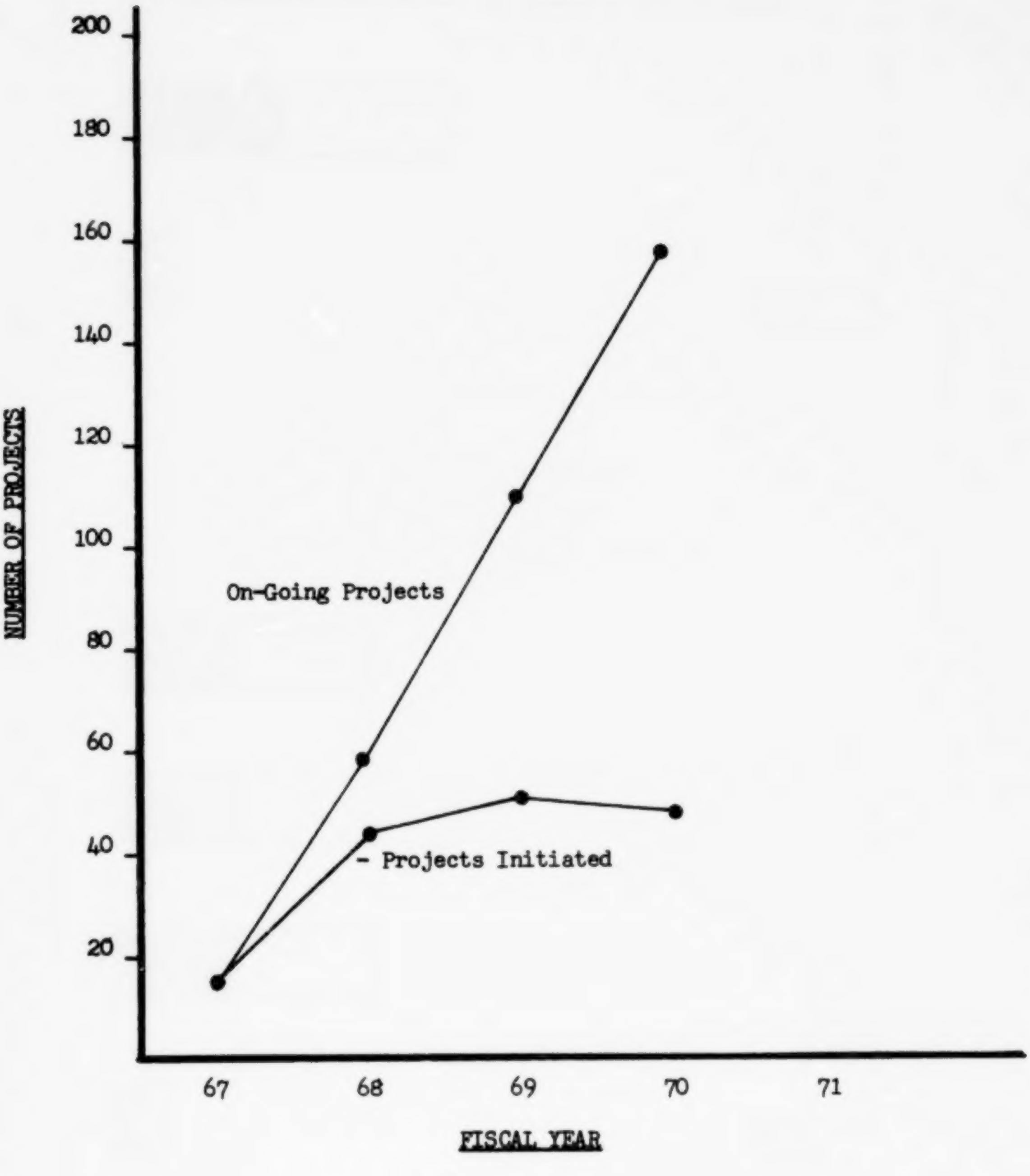


FIGURE III

INDUSTRIAL POLLUTION CONTROL BRANCH
PROJECT PARTICIPATION



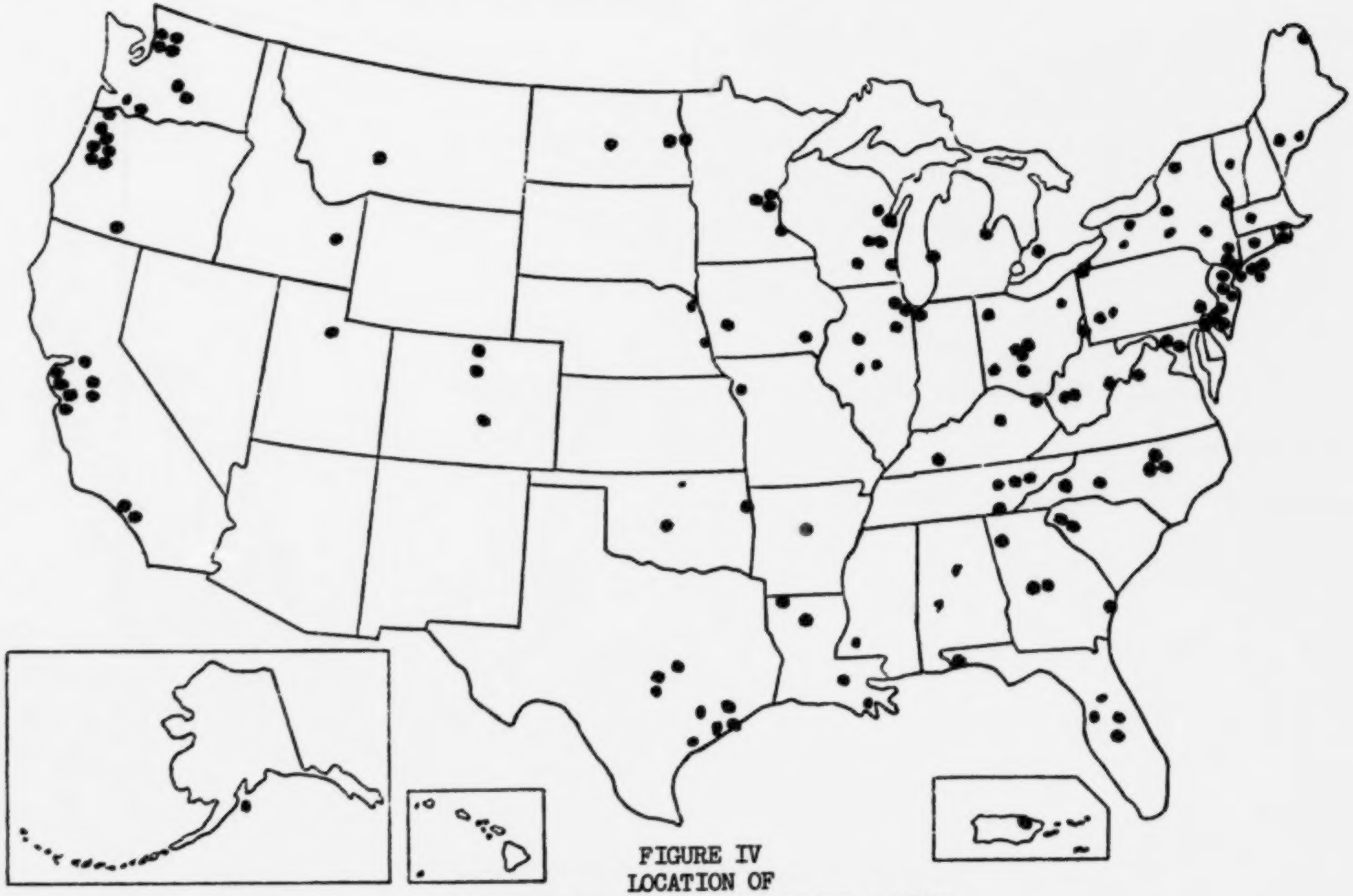
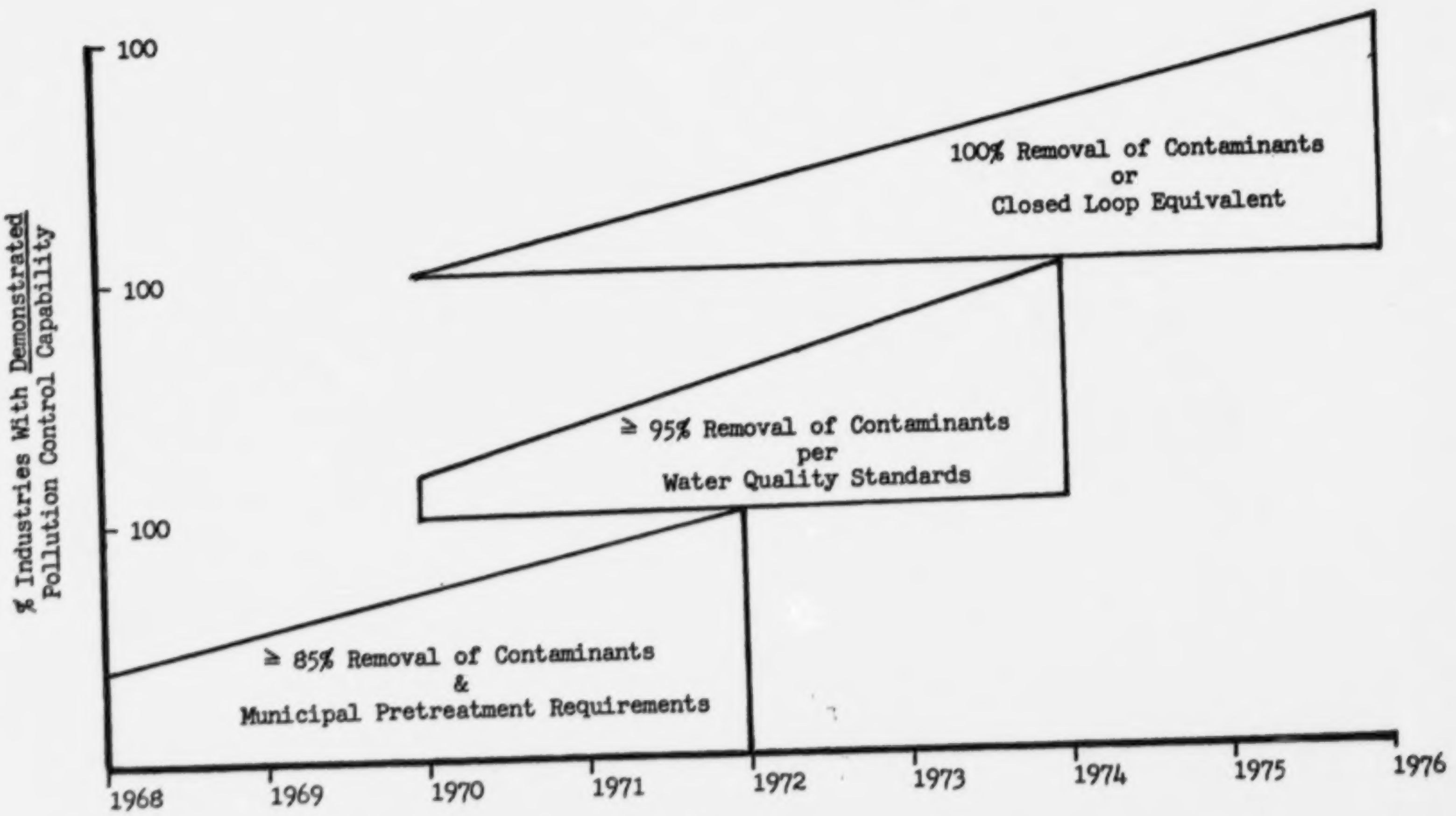


FIGURE IV
LOCATION OF
INDUSTRIAL POLLUTION CONTROL BRANCH
RESEARCH, DEVELOPMENT, AND DEMONSTRATION CONTRACTS AND GRANTS

INDUSTRIAL POLLUTION CONTROL MILESTONES - FIGURE V



PPB 1201

METAL & METAL PRODUCTS

12010	TO	GPO	PM
DOT	U. of Waterloo-Byerley	C. Risley	E. Dulaney
DIM	U. of Utah-Miller	J. Rouse	E. Dulaney
DHP	Clarkson College of Tech.-Jellinek	C. Risley	E. Dulaney
41	Chem. Separations Corp.	J. Fisher	W. Lacy
DUL	Armco Steel Corp.	R. Feder	E. Dulaney
EZV	Armco Steel Corp.	R. Feder	E. Dulaney
EIE	Metal Finishers Foundation	J. Ciancia	E. Dulaney
DSA	S.K. Williams Co.	C. Risley	E. Dulaney
DPF	Volco Brass & Copper	J. Ciancia	E. Dulaney
DMF	The Beaton & Corbin Co.	J. Ciancia	E. Dulaney
DFS	RAI Research Corp.	L. Kahn	E. Dulaney
DRE	Interlake Steel Corp.	C. Risley	E. Dulaney
DNF	CF&I Steel Corp.	F. Pfeffer	E. Dulaney
DRH	Minnesota Pollution Control Agency	C. Risley	E. Dulaney
EDY	Am. Iron & Steel Inst.	F. Pfeffer	E. Dulaney
DTQ	Weirton Steel	W. West	E. Dulaney
EQF	Alabama Water Improvement Commission	E. Lomasney	E. Dulaney
FNM	Fitzsimons Steel Co., Inc.	R. Feder	E. Dulaney
FPK	Battelle (Columbus)	R. Feder	E. Dulaney

METALS AND METAL PRODUCTS

E. L. Dulaney, P.E.

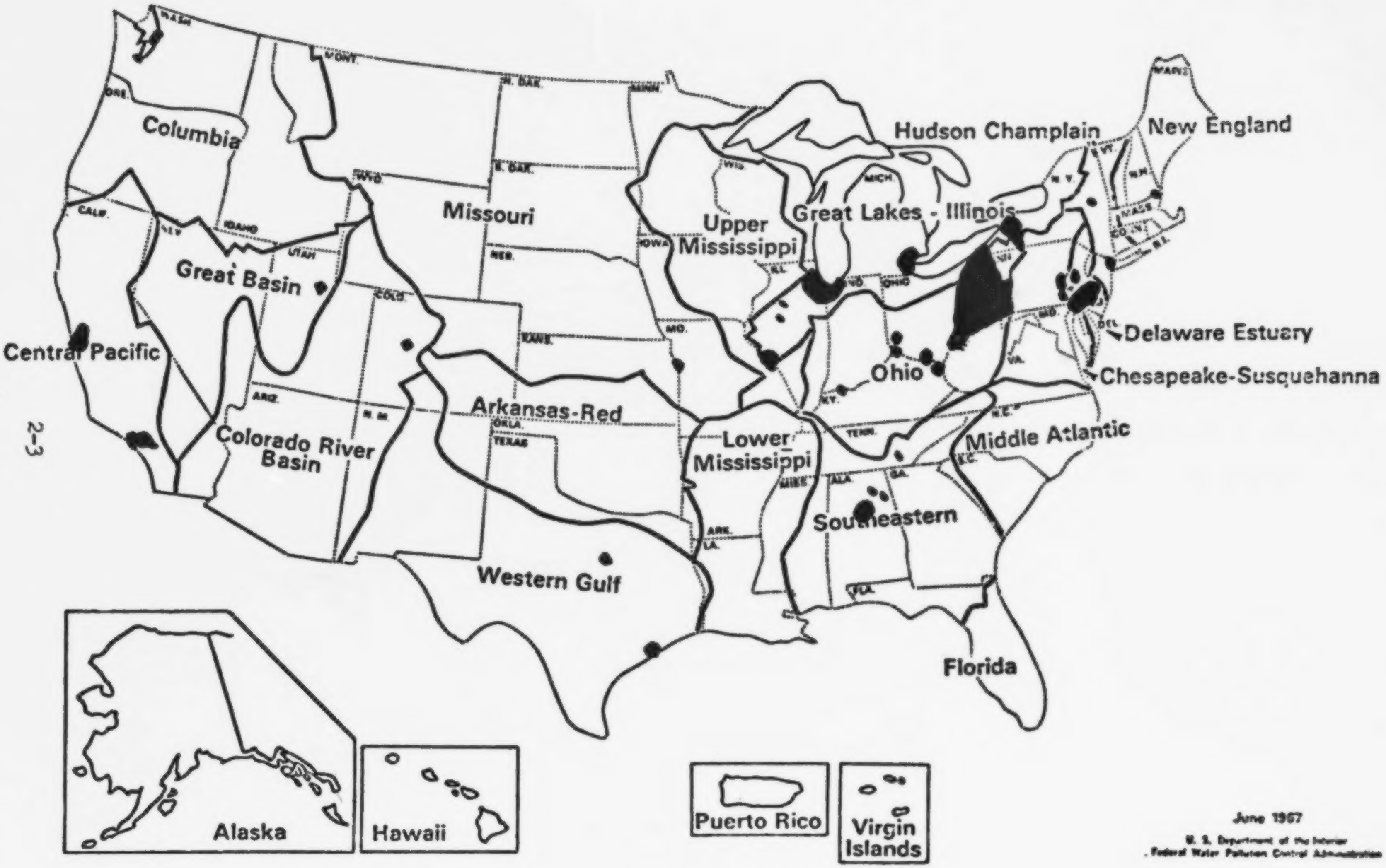
Three broad categories of industrial activities are included in this subprogram element of the FWQA Research and Development Program. These are the ferrous metals industries, the nonferrous metals industries, and metal finishing operations.

The steel industry uses approximately 16 billion gallons of water per day or 19% of total industrial water usage. Most of the water is used for non-contact cooling purposes. Approximately 2.5 billion gallons per day is used in processing operations such as coke oven gas scrubbing, blast furnace gas washing, basic oxygen gas scrubbing, hot rolling, pickling and rinsing, cold rolling, and dipping and other finishing operations. These operations contaminate the water with large amounts of particulate matter, oil, acid, soluable salts, ammonia, cyanide, phenols and other organic and mineral compounds. Most of the waste streams are better suited for chemical and/or physical treatment methods rather than biological methods. In addition to the usual R&D program objectives of improved treatment process efficiency at reduced costs and increased water reuse, an additional objective in the ferrous metals industry is the determination of the cost of waste treatment not only for each major procesing operation, but the treatment costs in total to achieve a unit of product.

The nonferrous metals industries include aluminum, copper, zinc, lead, nickle, and many others. These industries use approximately 1.3 billion gallons of water per day. Like the steel industry the wastes are high in particulate and mineral compounds and are best treated by chemical and/or physical means.

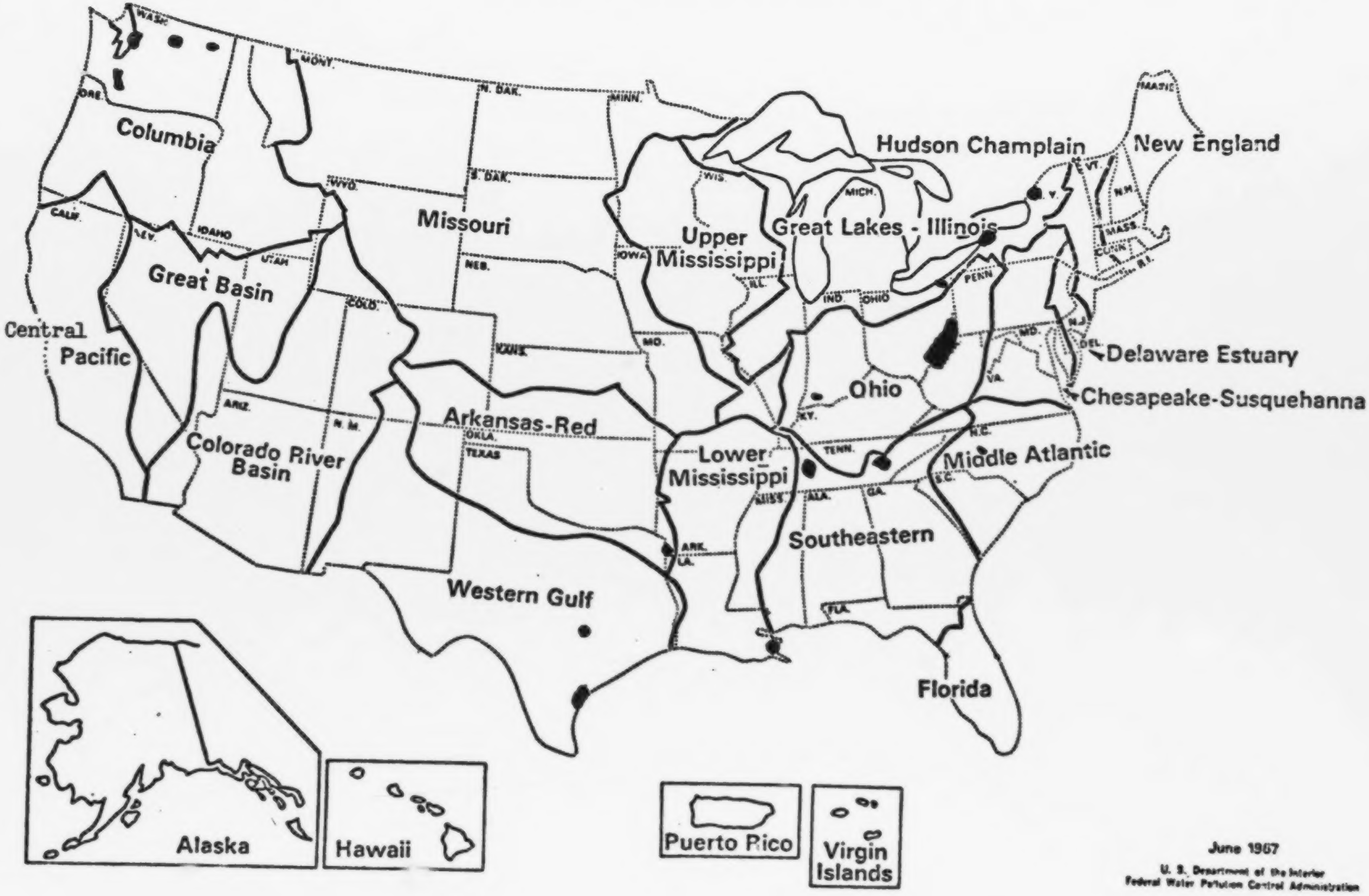
There are approximately 20,000 captive and independent metal finishing operations within the United States. The prinicpal operations include stripping, electroplating, anodizing, and etching (e.g. printed circuits). While waste volumes are not normally large compared to the steel, paper, food processing, or petroleum industries, their frequently corrosive and highly toxic nature make these wastes particularly hazardous. Waste treatment, usually by chemical processes, is necessary to protect sewer lines from corrosion, sewer maintenance crews from toxic gases and minerals, receiving municipal biological treatment plants from deactivation by slugs or accumulations of toxic materials, and for protection of all species coming into contact with the receiving waters.

LOCATION OF MAJOR BLAST FURNACES & STEEL MILLS
PPB 1201: Metals & Metal Products


Columbia
Missouri
Upper Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Great Basin
Central Pacific
Colorado River Basin
Arkansas-Red
Ohio
Delaware Estuary
Chesapeake-Susquehanna
Lower Mississippi
Middle Atlantic
Southeastern
Western Gulf
Florida
Alaska
Hawaii
Puerto Rico
Virgin Islands

June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

LOCATION OF PRIMARY ALUMINUM & ELECTROMETALLURGICAL PRODUCT PLANTS
PPB 1201: Metals & Metal Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Ohio
Delaware Estuary
Chesapeake-Susquehanna
Middle Atlantic
Southeastern
Florida
Alaska
Hawaii
Puerto Rico
Virgin Islands
WASH.
ORE.
CALIF.
NEV.
IDAHO
UTAH
ARIZ.
MONT.
WYO.
COLO.
N. M.
N. DAK.
S. DAK.
NEB.
KANS.
OKLA.
TEXAS
MINN.
IOWA
MO.
ARK.
LA.
WIS.
ILL.
MICH.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
GA.
FLA.
S.C.
N.C.
VA.
MD.
DEL.
N.J.
PENN.
N. Y.
VT.
N.H.
MASS.
CONN.
R.I.
MAINE

June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12010 DOT

TITLE OF PROJECT: Detoxication of Cyanide Wastes by Electroxidation

GRANTEE: University of Waterloo
Waterloo, Ontario, Canada

PROJECT DIRECTOR: Dr. J. J. Byerley

Project Site: Waterloo, Ontario, Canada

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 1, 1970

Project Cost: $10,600 (2nd yr.)

Completion Date: May 1, 1971

Federal Cost: $10,065 (2nd yr.)

DESCRIPTION OF PROJECT

This grant provides for a continuation of the investigation of the fundamentals of the electroxidation of cyanide in plating room rinse waters and for the development, design, construction, and test operation of a 2gpm demonstration unit on simulated cyanide wastes; on typical copper, cadmium, and brass cyanide plating rinse waters (40-150 ppm total cyanide); and on mixed plating room effluents also containing hexavalent chromium, nickel, and sulfates.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Research *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: University of Utah
Salt Lake City, Utah
Dr. Jan D. Miller

TITLE OF PROJECT: Depression of Pyrite in Sulfide Flotation Systems Without the use of Cyanide

PROJECT SITE: Salt Lake City, Utah

DATE AWARDED: January 29, 1969

FEDERAL GRANT: $12,663.00

TOTAL EST. PROJ. COST: $13,559.00

PROJECT NUMBER: 12010 DIM

PPBS NO. 1201

Date Effective: January 1, 1969

DESCRIPTION OF PROJECT:

The objective of this project is to develop a technique for the depression of pyrites in the froth flotation of sulfide ores by the addition of organic salts in place of commonly used cyanides. The oxidation potential of pure systems will be varied to determine explicitly the conditions which must be imposed to depress pyrites. Batch flotation tests on two natural sulfide ores containing pyrite will then be conducted to determine the feasibility of pyrite depression in a natural system under conditions prescribed for the pure system.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

RN 11/68

INFORMATION SHEET

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals and Metal Products

TITLE of PROJECT : Metal Removal/Recovery from Polluted Water by Complexation with Linear Polyelectrolytes

PROJECT SITE : Potsdam, New York

GRANTEE or CONTRACTOR
: Clarkson College of Technology
Potsdam, New York 13676

PROJECT DIRECTOR
Dr. H. H. G. Jellinek
Chemistry Department
Clarkson College of Technology

PROGRAM NUMBER
: 12010 DHP; 2nd year

GRANT or CONTRACT NUMBER

TOTAL ESTIMATED COST
: $30,780

GRANT or CONTRACT AMOUNT
$ 27,086 *or* 88.0 *%*
of eligible project costs.

PROJECT PERIOD
Months : 12 months
From : March 1, 1970
To : March 1, 1971

DESCRIPTION of PROJECT :

During the first year several synthetic and natural systems were found to be effective in removal of metal ions from simulated plating rinse waters. The second year will provide for (a) continuation of the search for more and better natural systems, (b) testing of systems on actual waste solutions from industry, (c) analysis of systems for yields, ease and speed of filterability, reuse of polyelectrolyte, efficiency of removal/recovery, loss of materials, and determination of complex stability constants and (d) determination of the details of processes suitable in practice for various metal industries.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 5/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Chemical Separations Corporation
Bus Terminal Road
Oak Ridge, Tennessee 37830

TITLE OF PROJECT: Acid Pickle Liquor Wastes Treatment Utilizing Advanced Ion Exchange Techniques

PROJECT SITE: Oak Ridge, Tennessee

DATE AWARDED: December 20, 1967

FEDERAL GRANT: \$50,400.00

TOTAL EST. PROJ. COST: \$72,000.00

PROJECT NUMBER: WPRD 41(R1)-01-68

PPBS NO. 1201

DESCRIPTION OF PROJECT:

The purpose of this grant is to determine the feasibility of using continuous ion exchange to strip Fe from pickling wastes and regenerate the acid for reuse. The iron will be converted to a high grade Fe_2O_3 for use in metallurgical processing as by-product.

Project Period: 15 months

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6b, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Armco Steel Corporation
Middletown, Ohio

TITLE OF PROJECT: "Treatment of Acid Rinse Waters"

PROJECT SITE: Middletown, Ohio

FEDERAL GRANT: $547,500

TOTAL EST. PROJ. COST: $1,784,800

PROJECT NUMBER: WPRD 168-01-68
12010 DUL

PPBS NO. 1201

PROJECT PERIOD: Nov. 1, 1967 to
Nov. 1, 1970

DESCRIPTION OF PROJECT:

The project provides for construction, operation, tests, and reports on facilities to treat 1500 gpm of acid rinse waters produced by the hydrochloric acid pickling of strip-steel preparatory to cold-rolling. The treatment process will consist of limestone neutralization, aeration, coagulation, sedimentation, sludge recirculation, vacuum filtration of the excess sludge, and effluent equalization.

All or nearly all of the acid and the compounds of iron will be removed by the treatment process. The chloride content of the waste is not changed by this process and may be such that dilution with other available wastes will be required in order to meet the state's proposed standards regarding total dissolved solids.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. NW*~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Armco Steel Corporation
Middletown, Ohio

TITLE OF PROJECT: Treatment of Waste Water - Waste Oil Mixtures

PROJECT SITE: Ashland, Kentucky

FEDERAL GRANT: $209,000

TOTAL EST. PROJ. COST: $1,541,720

PROJECT NUMBER: WPRD 169-01-68
12010 EZV

PPBS NO. 1201

PROJECT PERIOD: Nov. 1, 1967 to May 1, 1970

DESCRIPTION OF PROJECT:

This project provides for design, operation, studies, and reports on a full scale demonstration facility to be built by Armco for the treatment of 4.6 mgd of oil-water emulsion wastes from a five-stand cold-rolling mill. A five chemical treatment method of coagulation, flocculation, dissolved air flotation for oil-water separation, and sludge incineration will be used. The project schedule provides one year for construction and one year for operating studies of parameters and reporting of results.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b), *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: Metal Finishers' Foundation
Upper Montclair, New Jersey

TITLE OF PROJECT: "An Investigation of Techniques for the Removal of Chromium and Cyanides from Electroplating Wastes."

PROJECT SITE: Upper Montclair, N.J.

DATE AWARDED March 27, 1968

FEDERAL GRANT: $98,000

TOTAL EST. PROJ. COST: $145,000

PROJECT NUMBER: WPRD 201-01-68
12010 EIE

PPBS NO. 1201

DURATION: 2 years

PROJECT PERIOD: March 1, 1968
to April 30, 1970

DESCRIPTION OF PROJECT:

The Metal Finishers' Foundation will conduct a two-phase research and demonstration project on methods for economically treating cyanide and chromium wastes from small plating shops. Phase I will include (a) a "State of the Art" review of recovery techniques, (b) accumulation of data on waste stream compositions, (c) selection of techniques for bench scale study and selection of extractants and complexing agents, (d) bench scale experimental investigation of selected techniques and (e) evaluation of the test results and preparation of recommendations. This phase will require one year.

Phase II will consist of (a) the design of theprocess and the processing equipment, (b) acquisition and installation of the equipment in an electroplating plant, (c) operation of the demonstration plant to accumulate data, and (d) the evaluation of the data and preparation of reports.

The work will be performed by subcontract to the Battelle Memorial Institute at Columbus, Ohio. Various treatment methods; including liquid-liquid extraction, ion flotation, and precipitate flotation; will be investigated and compared.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. NW.~~
Washington, D. C. 20242

BLD:2/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant (s) *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals & Metal Products
TITLE of PROJECT : An Investigation of Techniques For the Removal of Chromium and Cyanides from Electroplating Wastes.
PROJECT SITE : Columbus, Ohio

GRANTEE or CONTRACTOR
: Metal Finishers' Foundation
248 Lorraine Avenue
Upper Montclair, N. J. 07043

PROJECT DIRECTOR
: G. R. Smithson
Bettelle Memorial Institute
Columbus, Ohio 43201

PROGRAM NUMBER
: 12010 EIE

GRANT or CONTRACT NUMBER
: WPRD 201

TOTAL ESTIMATED COST
: 28,140.90

GRANT or CONTRACT AMOUNT
$ 19,698.63 *or* 70 *%*
of eligible project costs.

PROJECT PERIOD
Months : 12 months
From : 1 Nov. 1969
To : 1 Nov. 1970

DESCRIPTION of PROJECT : This supplemental grant award is for the purpose of completing the research work on the carbon adsorption technique for removal of cyanide from plating wastes and for construction, testing, evaluation, and reporting on a demonstration facility in a small plating shop.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

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LRDWKR 4 /70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b), Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: **S. K. Williams Company**
2370 N 32nd Street
Milwaukee, Wisconsin 53210

TITLE OF PROJECT: "Electroplating Waste Treatment and Water Reuse"

PROJECT SITE: Milwaukee, Wisconsin *DATE AWARDED:* July 17, 1968

FEDERAL GRANT: $87,750 *TOTAL EST. PROJ. COST:* $157,306.80

PROJECT NUMBER: WPRD222-01-R1-68 12010 DSA *PPBS NO.* 1201

DESCRIPTION OF PROJECT: The S. K. Williams Company proposes to install a chemical pre-rinse type waste treatment plant (designed by Lancy Laboratories) to treat the drag-out from various operations in their new job-plating plant. Each section of the waste treatment facility will be expected to alternately or simultaneously treat the wastes from three to seven different processing operations. Sludges will be disposed of by landfill and 80-90% of the rinse waters will be reused. The blowdown rinse waters will be free of significant quantities of toxic substances.

The project period will be 8 months for construction and 12 months for operation, maintenance, and post construction studies and reports.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. N.W.*~~
Washington, D. C. 20242

ELD/6-68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Volco Brass and Copper Company
Kenilworth, New Jersey 07033

TITLE OF PROJECT: "Treatment Recovery, and Reuse of Copper Wire Mill Pickling Wastes."

PROJECT SITE: Kenilworth, N. J.

DATE AWARDED: June 28, 1968

FEDERAL GRANT: $124,000

TOTAL EST. PROJ. COST: $177,159

PROJECT NUMBER: WPRD 237-01-68
12010 DPF

PPBS NO. 1201

PROJECT PERIOD: 6/28/68 to 9/1/70

DESCRIPTION OF PROJECT: Volco Brass and Copper Company produces 75 TPD of copper and copper alloy wire. Wastes from the pickling, bright dipping, and drawing operations consist of spent treating solution dumps, drag-out, and rise waters containing acids; alkalies; and hexavalent chromium, copper, fluoride, and copper complexing ammonium ions. Lancy Laboratories has designed a process and waste treatment system which will recover the copper electrolytically, will regenerate the treating solutions, and will permit reuse of 95+% of the waste water as process water. The process is free of any significant sludge disposal problem. The project is to be completed in one year.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD 5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b), Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: The Beaton and Corbin Mfg. Co.
Southington, Connecticut

TITLE OF PROJECT: Chemical Treatment of Plating Waste for Elimination of Chromium, Nickel and Metal Ions

PROJECT SITE: Southington, Conn.

DATE AWARDED: June 3, 1968

FEDERAL GRANT: $37,250

TOTAL EST. PROJ. COST: $58,220

PROJECT NUMBER: WPRD 244-01-68
12010 DMF

PPBS NO. 1201

DESCRIPTION OF PROJECT: This is an industrial waste treatment project for the installation and demonstration of a chemical pre-rinse system for the removal of toxic materials from the wastes from a small electroplating plant. The treated effluent is expected to have a pH of 6.5 to 8.5 and will contain less than: 0.1 ppm of chromium, copper, nickel, or zinc; 100 ppm of chlorides or nitrates; 200 ppm of sulfates; 5 ppm of BOD; and will be color and odor free. Approximately two-thirds of the treated effluent will be reused for plating rinse water.

Precipitates of toxic metal ions will be produced by the chemical treatment of the segregated waste streams from the various plating lines. Sludges containing these precipitates will be routed to sludge drying beds. Dried sludges will be disposed of by landfill.

There are over three thousand similar sources of stream pollution in the New England area alone and over twelve thousand plating plants across the nation. This project will provide technical and economic data on an effective waste treatment method. It is anticipated that this information will be of value to many firms, who because of insufficient funds, could not themselves undertake the engineering and development costs required.

PROJECT PERIOD: June 3, 1968 to February 3, 1970

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD 4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: RAI Research Corp.
36-40 37th Street
Long Island City, N.Y. 11101

TITLE OF PROJECT: "Treatment of Cyanide Rinse Waters by Electrodialysis"

PROJECT SITE: Long Island City, N.Y.

DATE AWARDED: Nov. 11, 1968

FEDERAL GRANT: $58,685

TOTAL EST. PROJ. COST: $83,835

PROJECT NUMBER: WPRD-270-01-68
12010 DFS

PPBS NO. 1201

PROJECT PERIOD: 11/11/68 to 1/1/70

DESCRIPTION OF PROJECT: This project provides for a laboratory study of the application of electrodialysis to the treatment of a cyanide solution which simulates the rinse water from a copper "strike" electroplating operation. The objective is to develop design parameters and to define economic factors as a basis for a later demonstration program with an industrial plating firm.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD/6-68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b), *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: **Interlake Steel Corporation**
310 South Michigan Avenue
Chicago, Illinois 60604

TITLE OF PROJECT: **Pollution Control of Blast Furnace Gas Washer Through Recirculation**

PROJECT SITE: **Chicago, Illinois** *DATE AWARDED:* January 27, 1969

FEDERAL GRANT: **$175,200.** *TOTAL EST. PROJ. COST:* **$525,600.**

PROJECT NUMBER: WPRD 208-01-68
12010 DRE
PPBS NO. 1201

DESCRIPTION OF PROJECT: **The full scale demonstration project will provide additional facilities for the treatment and reuse of 7.2 mgd of blast furnace gas washer water from the venturies and coolers on two blast furnaces. The water before treatment contains 700 ppm of suspended solids, 1630 ppm of total solids, 3ppm cyanides, and 100 ppb of phenols. An anionic polyelectrolyte will be used to improve recovery of magnetite ($\mathrm{Fe3}^{\mathrm{O4}}$) and removal of cyanides in the primary clarifier. In addition, polyphosphates and chlorine will be used as required to prevent a hydrogen cyanide hazard in the vacinity of the cooling tower. A new cooling tower will reduce the water temperature and further reduce cyanides thus permitting reuse of most of the water. The cooling tower blowdown will be used to cool slag. The blowdown stream will be evaporated and leave its dissolved solids on the slag pile. The blowdown rate will be determined by the allowable alkalinity of the recirculated water. The water is passed through cooling coils in the walls of the blast furnaces before routing through the venturies. This is expected to limit the alkalinity to 500 ppm.**

The project period of 18 months is based on anticipated completion of construction in July 1969 and Final Report by August 1, 1970.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~.
Washington, D. C. 20242

ELD 11/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: CF&I Steel Corporation
P. O. Box 1920
Denver, Colorado 80201

TITLE OF PROJECT: Research Study of Coal Preparation Plant and By Product Coke Plant Effluents

PROJECT SITE: Pueblo, Colorado

DATE AWARDED: MAR 27 1969

FEDERAL GRANT: $86,500.00

TOTAL EST. PROJ. COST: $205,000.00

PROJECT NUMBER: 12010 DNF

PPBS NO. 1201

PROJECT PERIOD: March 27, 1969 to August 1, 1970

DESCRIPTION OF PROJECT:

This project will provide for (a) a study of waste sources, volumnes, and characteristics, (b) laboratory and bench scale studies of alternate treatment processes, and (c) a study of additions to planned coal washery filtration facilities to develop reuse possibilities of non-coking solids and solids waste disposal. Development of methods for waste water treatment to produce effluents suitable for reuse or discharge in accordance with state stream standards will be a major objective.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 b, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Minnesota Pollution Control Agency
717 Delaware Street, Southeast
Minneapolis, Minnesota 55440

TITLE OF PROJECT: "Study of Reverse Osmosis for Treating Metal Finishing Effluents"

PROJECT SITE: Minneapolis, Minnesota **DATE AWARDED:** June 30, 1969

FEDERAL GRANT: $49,737.00 **TOTAL EST. PROJ. COST:** $71,053.00

PROJECT NUMBER: 12010 DRH **PPBS NO.** 1201

DESCRIPTION OF PROJECT: The Minnesota Pollution Control Agency proposes to engage the North Star Research and Development Institute (3100 Thirty Eighth Ave., So., Minneapolis, Minnesota, 55406) to conduct Phase I of an anticipated three phase - three year project. The objectives of the project are to develop reverse osmosis (RO) for the treatment of metal finishing effluents (MFE) for the purposes of (a) eliminating pollutants from effluents, (b) recovery of valuable plating materials, and (c) recovery of waste waters for reuse.

Phase I will provide for screening of candidate membranes for effectiveness and compatibility in single ion applications, compatibility of support materials, investigation of promising membranes for improvement by modification, and investigation of operating parameters, e.g. temperature, pressure, thickness, strength, and permeability.

Phase II would extend the studies to mixed ion MFE's, life studies, and production aspects and costs of membranes.

Phase III would consist of scale-up studies on simulated MFE's and subsequently to actual MFE's with generation of data for commercialization.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

ELD 4/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
American Iron & Steel Institute
150 East 42nd Street
New York, New York 10017

PROJECT DIRECTOR: (Name and Address)
John E. Barker
Manager, Pollution Control
Armco Steel Corporation
Middletown, Ohio 45042

TITLE OF PROJECT: "Biological Removal of Carbon and Nitrogen Compounds from Coke Plant Wastes"

PROJECT SITE: Houston, Texas

PROGRAM (PROJECT) NUMBER: 12010 EDY

DATE OFFERED: May 21, 1969

DATE ACCEPTED (AWARDED): June 25, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/25/69 Thru: 9/24/70	$156,000	$109,200

DESCRIPTION OF PROJECT:

The Armco Steel Corporation, under the sponsorship of the AISI and with the assistance of the AISI Fellowship at Mellon Institute will design, construct, operate, optimize, and evaluate a 1 gpm pilot facility for the three stage biological treatment of raw ammoniacal liquors from the by-product coke plant of Armco Steel located at Houston, Texas. A typical analysis of this waste would indicate 1240 ppm of phenol, 60 ppm cyanide, and 6400 ppm ammonia. The three stage biological treatment system is designed to accomplish (a) oxidation of carbonaceous material (aerobic), (b) nitrification of nitrogenons compounds (aerobic) and (c) nitrate reduction to nitrogen gas (anaerobic). Laboratory testing indicates that removal of 75% of organic carbon, 99% of phenol and cyanide and essentially all of the ammonia can be expected. The pilot facility will provide the basis for the design of a full scale facility.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD 5/69

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR ~~CONTRACTOR~~; (Name and Address)
Weirton Steel Division
National Steel Corporation
Box 431
Weirton, West Virginia 26062

PROJECT DIRECTOR: (Name and Address)
William M. Smith
Manager, Industrial Hygiene Engineering
Weirton Steel Division

TITLE OF PROJECT: Combined Steel Mill and Municipal Wastewaters Treatment

PROJECT SITE: Weirton, West Virginia

PROGRAM (PROJECT) NUMBER: 12010 DTQ

DATE OFFERED: July 14, 1969

DATE ACCEPTED (AWARDED): July 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/30/69 Thru: 7/29/70	$ 163,963	$ 95,918

DESCRIPTION OF PROJECT:

This grant supports Phase I of grantee's anticipated three phase project to provide an overall waste treatment system to treat effluents from an integrated steel mill and the domestic wastes from the City of Weirton, West Va. The mill produces the full spectrum of steel industry wastes. Waste water volumes currently are 226 mgd and 1.2 mgd from the mill and the city respectively. The general approach will be to reduce volumes by providing treatment to maximize reuse, to provide pretreatment as required for subsequent combined treatment, to provide combined treatment of sanitary and specific mill wastes where a synergestic effect can be anticipated, in an expanded municipal facility, and to provide complete treatment of the remaining wastes.

Phase I consists of three tasks which include wastewater characterization and analysis of existing facilities, accessment of alternative treatment processes, and determination of the feasibility of a joint municipal-industrial waste treatment demonstration facility. Phase I will require twelve months to complete.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Alabama Water Improvement Commission
State Office Building
Montgomery, Alabama 36104

PROJECT DIRECTOR: (Name and Address)
R.E. Lacey, Head, Membrane Processes Section
Southern Research Institute
Birmingham, Alabama 35205

TITLE OF PROJECT: Electromembrane Process for Regenerating Acid from Spent Pickle Liquor

PROJECT SITE: Birmingham, Alabama

PROGRAM (PROJECT) NUMBER: 12010 EQF

DATE OFFERED: August 14, 1969

DATE ACCEPTED (AWARDED): Sept. 9, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: One Year Thru:	$30,000	$ 20,000

DESCRIPTION OF PROJECT:

This project provides for the experimental investigation of an electromembrane process for the recovery of sulfuric acid and iron or iron oxide from spent sulfuric acid pickling liquors. The investigation will determine the technical feasibility of the process in a bench scale operation, provide engineering data for the design of larger recovery units, and develop engineering cost estimates to indicate the economic feasibility of the process. The bench scale studies will be directed at development of the configuration, mode, and conditions of operation required to minimize power requirements.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD 8/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals & Metal Products
TITLE of PROJECT : Recovery of Sulfuric Acid and Ferrous Sulfate From Waste Pickle Liquor
PROJECT SITE : Youngstown, Ohio

GRANTEE or CONTRACTOR
: The Fitzsimons Steel Co., Inc.
P. O. Box 1469; 1623 Wilson Ave.
Youngstown, Ohio 44501

PROJECT DIRECTOR
: William Thornton
The Fitzsimons Steel Co., Inc.

PROGRAM NUMBER
: 12010 FNM

GRANT or CONTRACT NUMBER
: –

TOTAL ESTIMATED COST
: $143,998

GRANT or CONTRACT AMOUNT
$39,056.50 *or* 70 *%*
of eligible project costs.

PROJECT PERIOD
Months : 26 months
From : March 23, 1969
To : May 23, 1971

DESCRIPTION of PROJECT :
This grant provides for the engineering plans, installation, operation, testing, evaluation and reporting on a full-scale facility for the elimination of 55,000 gallons per month of spent sulfuric acid pickle liquor discharge. A vacuum cooling-crystallization system will remove ferrous sulfate and concentrate the remaining acid solution for recycle to the pickling tanks. Processes for recycle or treatment of the acid rinse waters and for conversion of ferrous sulfate to other more marketable products will be evaluated. John N. Cernica & Associates, Consulting Engineers, will direct the studies and evaluations and prepare reports.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
✓ *Federal Water Pollution Control Administration*
LRDWKR 4/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Contract *awarded under Section* five *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Metals & Metal Products

TITLE of PROJECT: A Review of Water Pollution Control Practices and Problems in the Nonferrous Metals Industries.

GRANTEE or CONTRACTOR
: Battelle Memorial Institute
505 King Avenue
Columbus, Ohio 43201

PROJECT DIRECTOR
: G. R. Smithson
Chief, Minerals & Metallurgical
Waste Technology Division, BMI

PROGRAM NUMBER
: 12010 FPK

PROJECT SITE
Columbus, Ohio

TOTAL ESTIMATED COST
: $72,500

GRANT or CONTRACT AMOUNT
$68,060 or 95%

PROJECT PERIOD
Months : 9 months
From : June 25, 1970
To : March 25, 1971

DESCRIPTION of PROJECT:

Baseline data on water pollution problems and R&D needs related to domestic mining, ore concentration and reduction, and metal extraction operations in the nonferrous metals industries will be obtained. The industries to be studied will be grouped as follows: (a) copper, lead, zinc, and cadmium, (b) aluminum and magnesium, (c) nickel and cobalt, and (d) minor metals, e.g., molybdenum, beryllium, manganese, etc.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
✓ *Federal Water Pollution Control Administration*
LRDWKR 4/70 *Washington, D.C. 20242*

PPB 1202

CHEMICALS & ALLIED PRODUCTS

12020	TO	GPO	PM
DJI	B. F. Goodrich Chem. Co.	G. Horowitz	G. Rey
DIS	Union Carbide Corp.	J. Horn	G. Rey
DQC	Dept. Commerce & Industry State of Louisiana	J. Horn	G. Rey
EEQ	Dow Chemical Co.	J. Horn	G. Rey
EAW	E. I. DuPont	J. Ulshoefer	G. Rey
EAS	Dow Chemical Co.	C. Risley	G. Rey
EGM	Farmers Chemical Co.	E. Lomasney	G. Rey
EFW	Armour Industrial Chemical Company	C. Risley	G. Rey
EGC	Alabama Geological Survey & Oil and Gas Bd.	E. Lomasney	G. Rey
ERM	Mineral Pigments Corp.	S. Griggs	G. Rey
FYE	Univ. of Texas	T. Sargent	G. Rey
FPD	Battelle (Northwest)	T. Sargent	G. Rey
FOH	Geigy Chem. Co.	D. Stonefield	G. Rey
EXG	MFG. Chemists Assn.	H. Gorchev	G. Rey
FER	Union Carbide Corp.	J. Ferguson	G. Rey
EPH	Celanese Corp.	J. Horn	G. Rey
EMI	State of Lousisana	J. Horn	G. Rey
14-12-435	C.W. Rice & Co	F. Stein	G. Rey
EID	Engineering Science, Inc.	G. Putnicki	G. Rey
EJI	NUS-C.W. Rice	F. Stein	G. Rey

PPB 1202

CHEMICAL AND ALLIED PRODUCTS

George Rey, Manager

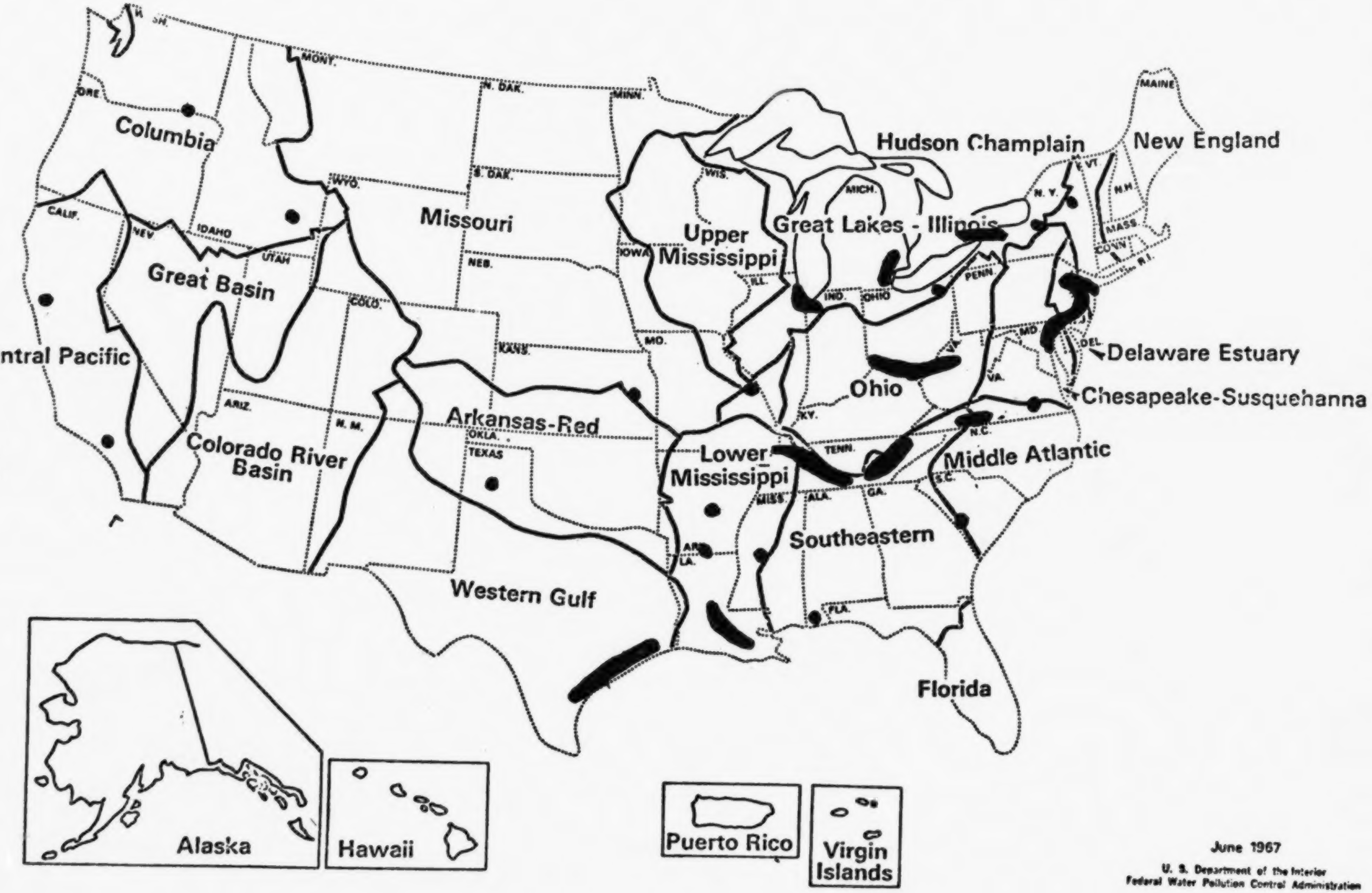
Objective: To establish the technology for new or improved pollution control methods, having industry wide application, which will allow all necessary degrees of water pollution control to be attained.

Significant Wastewater Sources of the Chemical Industry

SIC-CLASS	DESCRIPTION	WASTEWATER VOLUME DISCHARGE* (10^9 gals/YR)
2818	Organic Chemicals (n.e.c.)	1,660
282	Fibers, Plastics, Rubbers	509
2812	Alkalies & Chlorine	509
2819	Inorganic Chemicals (n.e.c.)	447
2815	Intermediate Coal Tar Products	100
287	Agriculture Chemicals	90
289	Miscellaneous Chemical Products	81
283	Drugs	42
2861	Gum and Wood Chemicals	24
284	Cleaning & Toilet Goods	23
2851	Paint & Allied Products	5
28	Total-Chemical & Allied Products	3,662

*Based on 1963 National Industrial Waste Water Assessment.

LOCATION OF MAJOR INORGANIC CHEMICAL INDUSTRIES
PPB 1202: Chemical & Allied Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Ohio
Southeastern
Florida
Middle Atlantic
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Alaska
Hawaii
Puerto Rico
Virgin Islands
WASH.
ORE.
CALIF.
NEV.
IDAHO
MONT.
WYO.
UTAH
COLO.
ARIZ.
N. M.
N. DAK.
S. DAK.
NEB.
KANS.
OKLA.
TEXAS
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IOWA
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ARK.
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WIS.
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TENN.
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GA.
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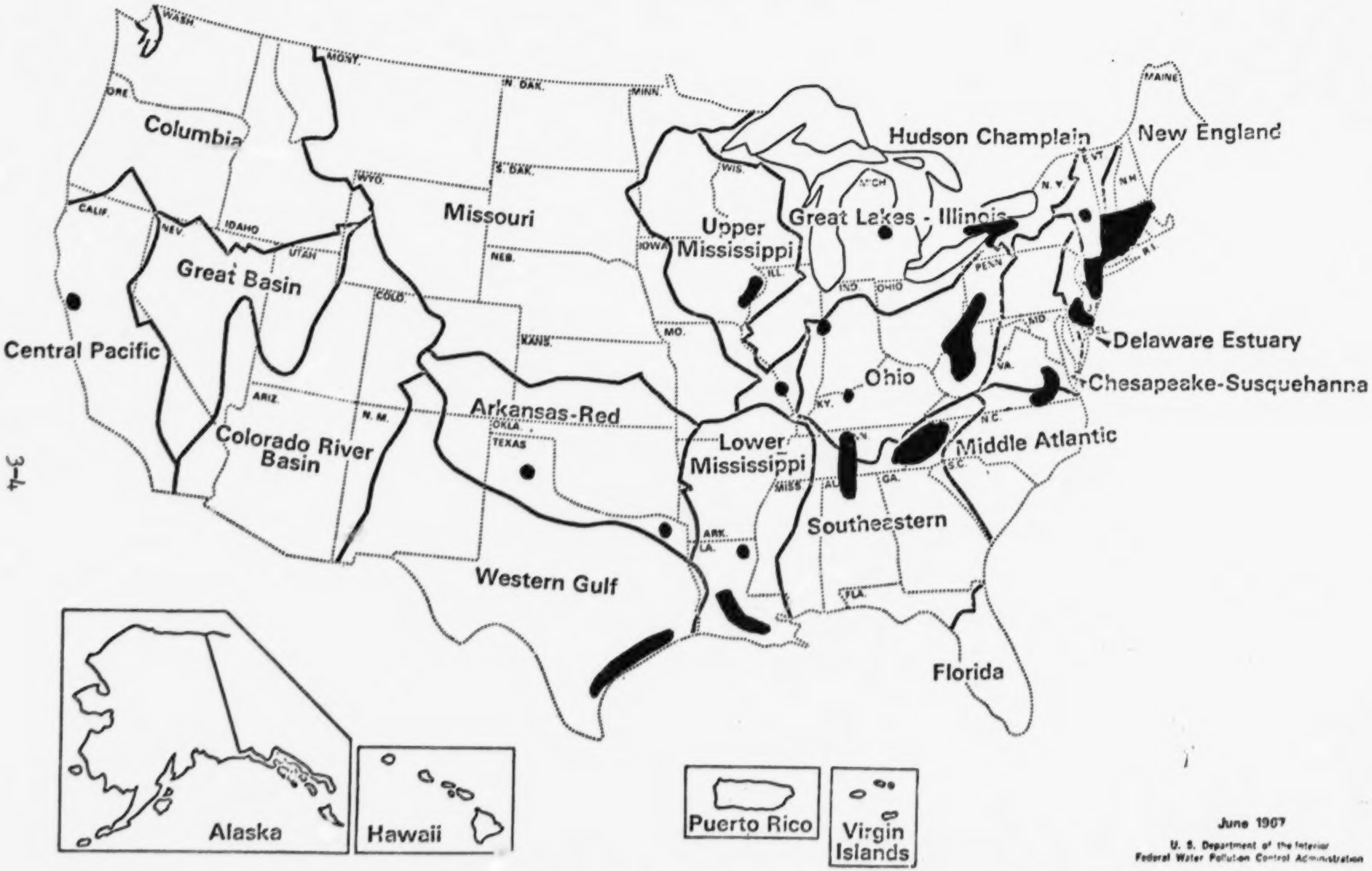
DEL.
PENN.
N. Y.
VT.
N.H.
MAINE
MASS.
CONN.
R.I.

June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

LOCATION OF MAJOR ORGANIC CHEMICAL INDUSTRIES
PPB 1202: Chemical & Allied Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Ohio
Southeastern
Florida
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Middle Atlantic
WASH.
ORE.
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UTAH
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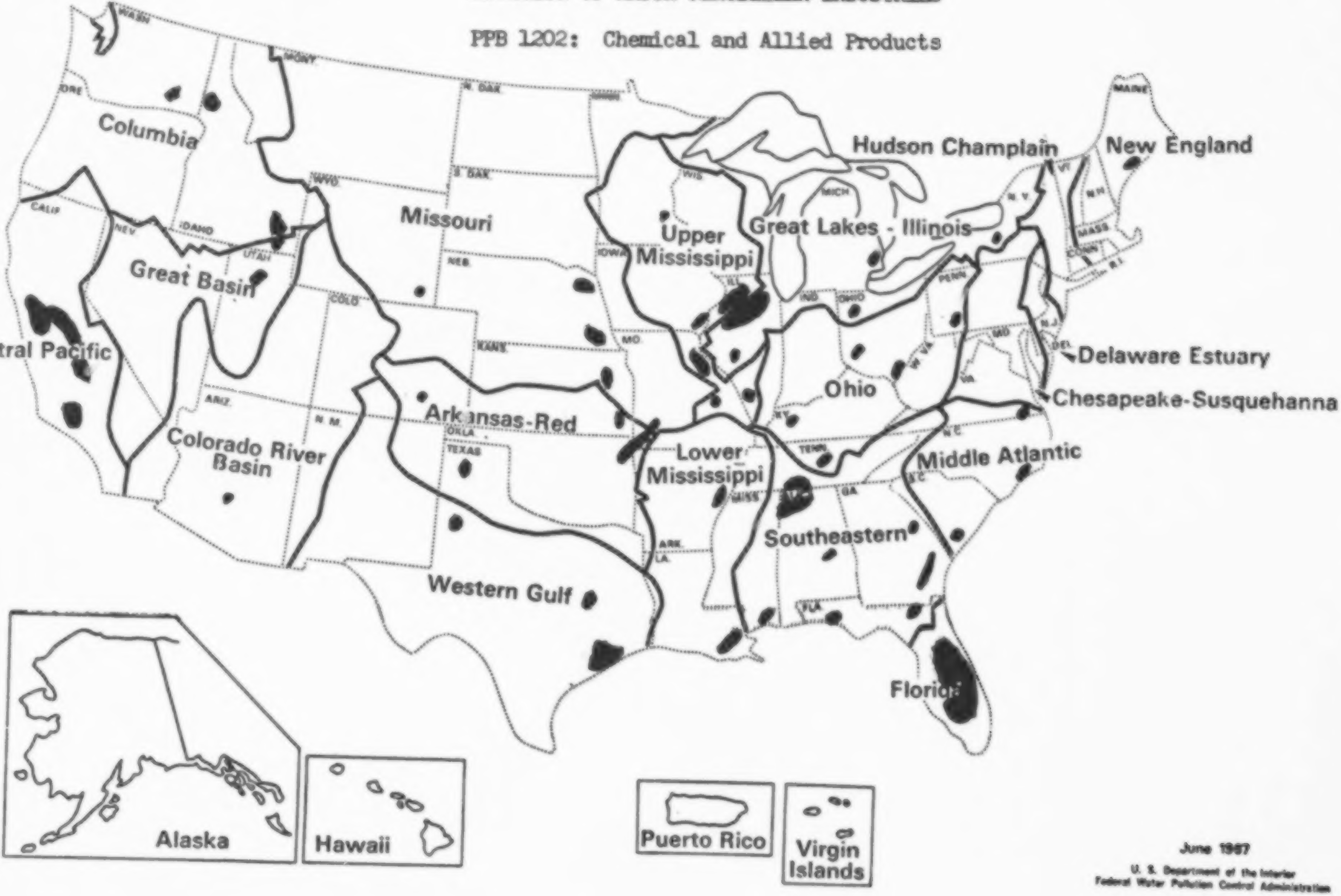
DEL.
Alaska
Hawaii
Puerto Rico
Virgin Islands

June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

LOCATION OF MAJOR FERTILIZER INDUSTRIES

PPB 1202: Chemical and Allied Products


Columbia
Great Basin
Central Pacific
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Ohio
Delaware Estuary
Chesapeake-Susquehanna
Middle Atlantic
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R.I.

June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: B. F. Goodrich Chemical Company
3135 Euclid Avenue
Cleveland, Ohio 44115

TITLE OF PROJECT: Waste Treatment Facilities for Poly Vinyl Chloride Manufacturing Plant

PROJECT SITE: Salem County, N. J. **DATE AWARDED:** JUL 2 1968

FEDERAL GRANT: $364,900 **TOTAL EST. PROJ. COST:** $823,100

PROJECT NUMBER: WPRD 248-01-68 12020 DJI **PPBS NO.** 1202

DESCRIPTION OF PROJECT: A development, demonstration, and evaluation project for the bio-chemical treatment of wastewaters from a typical poly vinyl chloride manufacturing plant, at a 0.85 mgd scale of operation.

The treatment system is to produce effluent to meet the receiving water standards (Delaware River) of greater than 85% removal of BOD, turbidity of not greater than 30 units above river water, and be free from taste and odor producing substances.

The process will consist of chemical pre-treatment with primary sedimentation, followed by activated sludge secondary treatment and a final polishing pond. Tertiary treatment studies with activated carbon are also contemplated to determine the extent to which the secondary effluent will lend itself to tertiary treatment, as future Delaware River standards may require the equivalent of tertiary treatment.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Union Carbide Corp.
R&D Department
Bound Brook, New Jersey 08805

TITLE OF PROJECT: Anaerobic Treatment of Synthetic Organic Wastes

PROJECT SITE South Charleston, W.Va. **DATE AWARDED:** December 11, 1968

FEDERAL GRANT: $220,400 **TOTAL EST. PROJ. COST:** $314,859

PROJECT NUMBER: 1202-DIS **PPBS NO.** 1202

DESCRIPTION OF PROJECT: To determine the technical and economic feasibility of an anaerobic-aerobic process for the treatment of composit organic chemical wastes from a complete petrochemical complex. Optimum results will be demonstrated on a 5000 gpd scale treatment facility to obtain design data and establish operating criteria for larger scale installations. The demonstration will be conducted subject to a technical an economic feasibility study based on laboratory scale research studies. The project will be for a two year period and will be initiated at the Union Carbide Technical Center at South Charleston, West Virginia.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Department of Commerce and Industry
State of Louisiana

TITLE OF PROJECT: Evaluation of Polymeric Materials for the Treatment and Recovery of Petrochemical Wastes.

PROJECT SITE: Baton Rouge, La.

DATE AWARDED: April 16, 1969

FEDERAL GRANT: $48,295

TOTAL EST. PROJ. COST: $68,992

PROJECT NUMBER: 12020 - DQC

PPBS NO. 1202

DESCRIPTION OF PROJECT:

Evaluation, of recently developed reverse osmosis membranes for application to in-plant chemical waste streams, under laboratory and field conditions. Various selected membranes and petrochemical in-plant waste streams will be examined in a high velocity test circuit to obtain engineering and economic data, to provide guidelines for the application of reverse osmosis to various selected in-plant waste streams to reduce net organic loads by recovering their product values.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

Washington, D. C. 20242

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The Dow Chemical Company
Texas Division
Freeport, Texas

PROJECT DIRECTOR: (Name and Address)
Mr. W. F. McIlheny
Contract Research Dept.
The Dow Chemical Company
Freeport, Texas 77541

TITLE OF PROJECT: "Treatment of Waste Waters Resulting from the Production of Polyhydric Organic Compounds"

PROJECT SITE: Freeport, Texas

PROGRAM (PROJECT) NUMBER: 12020 EEQ

DATE OFFERED: May 23, 1969

DATE ACCEPTED (AWARDED): June 5, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/5/69 Thru: 6/4/71	$282,490	$197,740

DESCRIPTION OF PROJECT: To develop a method of treatment of wastes from polyhydric manufacturing processes. Several alternative treatment methods will be examined to determine their technical, engineering, and economic feasibility. The results will be used to develop a conceptual design of a waste treatment facility for the briny wastes resulting from this chemical industry. Processes to be evaluated are aerobic biological systems, solvent extraction, foam fractionation, dialysis, and adsorption. Studies will include laboratory, bench scale, and pilot plant scale testing.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242 3-9

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)	E. I. du Pont de Nemours and Company Pigments Department Wilmington, Delaware 19898
PROJECT DIRECTOR: (Name and Address)	Dr. Lloyd L. Falk Senior Consultant E. I. du Pont de Nemours and Company, Engineering Dept. Wilmington, Delaware 19898

TITLE OF PROJECT: "Ocena Disposal of Industrial Wastes"

PROJECT SITE: Wilmington, Delaware

PROGRAM (PROJECT) NUMBER: 12020 EAW

DATE OFFERED: June 16, 1969

DATE ACCEPTED (AWARDED): June 24, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: July '69 Thru: April '70	$ 874,452	$ 150,116

DESCRIPTION OF PROJECT:

To evaluate the various technical and economic aspects of the dispersal of an acid-iron industrial waste at sea, over the continental shelf of the Atlantic off the coast of Delaware.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

GR/6/69

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6 (b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The Dow Chemical Company
1000 Main Street
Midland, Michigan 48640

PROJECT DIRECTOR: (Name and Address)
Frank Brower
Director, Hydrocarbons and Monomers Laboratory
1000 Main Street
Midland, Michigan 48640

TITLE OF PROJECT: Demonstration of the Recondition and Reuse of Organically Contaminated Brines from Chemical Process Industries

PROJECT SITE: Midland, Michigan

PROGRAM (PROJECT) NUMBER:
12020 EAS

DATE OFFERED: June 16, 1969

DATE ACCEPTED (AWARDED): June 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/30/69 Thru: 6/29/71	$ 1,300,408	$509,810

DESCRIPTION OF PROJECT:

Develop and demonstrate a chemical-adsorption process for wastewaters from a phenol manufacturing plant. The process will treat the wastewaters for the removal and recovery of phenol and acetate and the remaining brine wastewater will be utilized for caustic-chlorine production. The basic process involves the selective separation of organic constituents by activated carbon beds. Beds will be regenerated by chemical means.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Farmers Chemical Association, Inc.
Box 87
Harrison, Tennessee

PROJECT DIRECTOR: (Name and Address)
Edward C. Bingham
Tech. Asst. to Gen. Mgr.
Farmers Chemical Association, Inc.
Harrison, Tennessee 37341

TITLE OF PROJECT: "Removal of Nitrogenous Compounds from a Fertilizer Plant Effluent Using Modified Operation of Conventional Waste Treatment Systems"

PROJECT SITE: Tyner, Tennessee

PROGRAM (PROJECT) NUMBER: 12020 EGM

DATE OFFERED: June 13, 1969

DATE ACCEPTED (AWARDED): June 27, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/69 Thru: 6/71	$220,300	$154,210

DESCRIPTION OF PROJECT: A full scale development and demonstration of the treatment of nitrogenous fertilizer effluents using stripping or oxidation pretreatment techniques, followed by bio-nitrification in a conventional trickling filter sewage treatment plant as modified for the purpose of providing optimized removal of nitrogenous materials in the waste.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

GR 5/69

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________, under Section 6(b) ______________, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Armour Industrial Chemical Company
Chicago, Illinois 60611

PROJECT DIRECTOR: (Name and Address)
E. F. Harp
Director Engineering
8201 West 47th Street
McCook, Ill 60525

TITLE OF PROJECT: Armour Industrial Chemical Company Secondary Wastewater Treatment

PROJECT SITE: McCook, Illinois

PROGRAM (PROJECT) NUMBER: 12020 EFW

DATE OFFERED: August 26, 1969

DATE ACCEPTED (AWARDED): Oct. 6, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 4/25/69 Thru: 1/24/72	$503,000	$210,500

DESCRIPTION OF PROJECT:

The development and demonstration of a secondary treatment biological process to reduce the effluent, from a Fatty Acid Derivatives Chemical Plant, to less than 100 ppm of hexane soluble materials. Development work includes the evaluation of an existing pilot plant test unit, to be followed by a full scale (0.5MGD) demonstration at the Armour McCook, Illinois plant site. The treated effluent water quality improvement obtainable by use of a tertiary treatment process will also be explored on a pilot scale.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
State of Alabama
Geological Survey and Oil & Gas Board
University, Alabama

PROJECT DIRECTOR: (Name and Address)
Doyle B. Knowles
Hydraulic Engineer
University, Alabama

TITLE OF PROJECT: "Treatment and Disposal of Complex Chemical Wastes"

PROJECT SITE: Tuscaloosa, Alabama

PROGRAM (PROJECT) NUMBER: 12020 EGC

DATE OFFERED: Sept. 24, 1969

DATE ACCEPTED (AWARDED): Oct. 20, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/20/69 Thru: 4/19/72	$989,525	$314,525

DESCRIPTION OF PROJECT:

To develop and evaluate a surface or subsurface method for control of pollution from a complex chemical waste from a petrochemical complex, manufacturing alkyd resin and phenols. Also to develop methodology and/or testing techniques to permit projections of: (1) the fate of waste components, and (2) the waste assimulative capacity, of deep geological formations.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________, under Section 6 ______________, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Mineral Pigments Corporation
Muirkirk, Maryland

PROJECT DIRECTOR: (Name and Address)
Dr. Harold E. Weisberg
Technical Director
Mineral Pigments Corp.
Muirkirk, MD

TITLE OF PROJECT: Ion-Exchange Effluent Treatment Unit (PET)

PROJECT SITE: Muirkirk, Maryland

PROGRAM (PROJECT) NUMBER: 12020 ERM

DATE OFFERED: October 3, 1969

DATE ACCEPTED (AWARDED): Oct. 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/30/69 Thru: 10/29/70	$ 226,422	$115,967

DESCRIPTION OF PROJECT:

To develop and demonstrate the use of an ion-exchange process for recovery of chromate from chromate waste waters containing high concentrations (>1000 ppm) of chromate. The proposed process is one which is used for dilute chromate content cooling tower waters.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

3-15

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12020 FYE

TITLE OF PROJECT: Characteristics and Pollutional Problems of Pesticide Manufacturing Wastes

GRANTEE: University of Texas PROJECT DIRECTOR: Dr. Patrick R. Atkins

Project Site: Austin, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1970	Project Cost: $26,183
Completion Date: June 3C, 1971	Federal Cost: $24,143

DESCRIPTION OF PROJECT

State of the art study and survey on practices and research needs pertaining to wastewater treatment and pollution control technology related to pesticide-herbicide manufacturing industry.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,

WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70) GR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V *awarded under Section* 5RG *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemicals and Allied Products

TITLE of PROJECT : A State-of-the-Art Survey of Water Pollution Resulting from Fertilizer Manufacturing Operations

PROJECT SITE : Richland, Washington

GRANTEE or CONTRACTOR
: Battelle-Northwest
P. O. Box 999
Richland, Washington

PROJECT DIRECTOR
: H. T. Fullam
Battelle-Northwest
P. O. Box 999
Richland, Washington

PROGRAM NUMBER
: 12020

GRANT or CONTRACT NUMBER
: 12020 FPD

TOTAL ESTIMATED COST
: $24,750

PROJECT PERIOD
Months : 12
From : 7/1/70
To : 6/30/71

GRANT or CONTRACT AMOUNT
$23,500 *or* 95 %
of eligible project costs.

DESCRIPTION of PROJECT :

The proposed program is a study to evaluate water pollution problems of the fertilizer manufacturing industry. Problem areas in the various manufacturing operations will be defined, and the magnitude and types of water pollution identified. Current and planned industry efforts to control, reduce, and treat effluents which could interfere with quality standards will be evaluated.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRD:WKR 2/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Geigy Chemical Waste Treatment Facility

PROJECT SITE : Cranston, Rhode Island

GRANTEE or CONTRACTOR : Geigy Chemical Corporation	*PROJECT DIRECTOR* : Robert F. Curran
PROGRAM NUMBER : 1202	*GRANT or CONTRACT NUMBER* : 12020 FOH
TOTAL ESTIMATED COST : $1,268,300	*PROJECT PERIOD*
GRANT or CONTRACT AMOUNT	*Months* : 30 months
$ 393,600 *or* 31 *%*	*From* : 24 March 1970
of eligible project costs.	*To* : 24 September 1972

DESCRIPTION of PROJECT :

(1) Demonstration of the feasibility of a multi-stage (three or more) plastic media trickling filter process for wastewaters from multiple organic chemicals plant. (2) Develop and demonstrate technical feasibility of total process control by automated systems for the process. (3) Evaluate the performance of a specific design of plastic media. (4) Demonstrate the stage-wise acclimation of micro-organisms as a factor in attaining extra high loading per unit of trickling filter packing. (5) Evaluate the performance of an additional treatment operation for further effluent quality improvement.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWKR / Washington, D.C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Manufacturing Chemists Association, Inc.
1825 Connecticut Avenue, N. W.
Washington, D. C. 20009

PROJECT DIRECTOR: (Name and Address)
Edwin L. Barnhart
Hydroscience Inc.
316 Broad Ave.
Leonia, New Jersey 07650

TITLE OF PROJECT: "The Effects of Chlorination on Treated Organic Chemicals"

PROJECT SITE: Leonia, New Jersey 07650

PROGRAM (PROJECT) NUMBER: 12020 EXG

DATE OFFERED: February 16, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 1 Jan 70 Thru: 1 Jan 71	$ 60,000	$ 42,000

DESCRIPTION OF PROJECT:

To conduct a study to determine any adverse effects that might result from the chlorination of certain industrial chemicals either before or after biological treatment. Specifically to:

1. To determine the effect of selected organic chemicals and their degradation products on chlorine demand and disinfection efficiency.
2. To determine, for selected chemicals, in which cases it is possible to form chlorinated compounds during disinfection of the treated effluent.
3. To determine the physical properties and degradation rate of any chlorinated compounds found.
4. To determine the influence of persistent chlorinated compounds on the stream biota. Several levels of life forms will be considered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act),

GRANTEE OR CONTRACTOR: (Name and Address)
Union Carbide Corporation
Research and Development Dept.
P. O. Box 8361
South Charleston, W. Va. 25303

PROJECT DIRECTOR: (Name and Address)
G. W. Kumke
(same as above)

TITLE OF PROJECT: Identification and Control of Petrochemical Pollutants Inhibiting Anaerobic Treatment Processes

PROJECT SITE: South Charleston, West Virginia

PROGRAM (PROJECT) NUMBER: 12020 FER

DATE OFFERED: January 13, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 18 Months Thru:	$67,050	46,936

DESCRIPTION OF PROJECT:

The objective of this project is to identify chemicals in the wastewater from a large petrochemical plant that are inhibitory to anaerobic treatment and to study applicable means to eliminate such inhibition. As an initial step, inhibitory chemicals will be identified by performing batch degradability studies in conjunction with analysis by the latest methods available at Union Carbide's Technical Center in South Charleston, W. Va. Materials of particular interest will be sulfates, α-β unsaturated carbonyl compounds, and ammonia. A second study will involve the use of a photosynthetic bacterial-algal culture to overcome sulfide problems (i.e. microbial inhibition and oxygen demand). Digestion studies in which a degradable substrate is spiked with various levels of inhibitory materials will bemade to indicate allowable levels. A final demonstration run in pilot facilties using typical wastewaters is planned to verify the findings of the laboratory study.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V GRANT *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Anaerobic-Aerobic Chemical Waste Treatment

PROJECT SITE : Bay City, Texas

GRANTEE or CONTRACTOR
: Celanese Corporation of America
522 Fifth Avenue
New York, N.Y. 10036

PROJECT DIRECTOR
: Dr. R. S. Dicks

PROGRAM NUMBER
: 1202

GRANT or CONTRACT NUMBER
: 12020 EPH

TOTAL ESTIMATED COST
: $600,000

GRANT or CONTRACT AMOUNT
$395,340 *or* 65.9 *%*
of eligible project costs.

PROJECT PERIOD
Months : 30
From : 6/30/70
To : 12/31/72

DESCRIPTION of PROJECT :
The proposed project will study and demonstrate the economics and process parameters of a bio-oxidation disposal system for high strength organic wastes on a commercial scale and compare the economics to deep well disposal.

Additionally, the project will:

1) Investigate the anaerobic conversion of intractable organic compounds to aerobically bio-degradable species to reduce the COD and BOD to levels suitable for discharge to receiving waters or for reuse.
2) Study the nitrate removal characteristics of the anaerobic-aerobic systems.
3) Demonstrate the use of automatic on-stream total organic carbon analyzers as process controllers and/or monitors.
4) Investigate the effects of series and parallel operation, changing recycle rates and dilution on the process efficiency.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWK(R) 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS II *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : 2818
TITLE of PROJECT : "Concentration and Removal of Industrial Wastes by Dialysis"
PROJECT SITE : New Orleans, Louisiana

GRANTEE or CONTRACTOR
: State of Louisiana
Department of Commerce & Industry

PROJECT DIRECTOR
: Bailey Chemical Company

PROGRAM NUMBER
: 1202

GRANT or CONTRACT NUMBER
: 12020 EMI

TOTAL ESTIMATED COST
: $67,262.64

PROJECT PERIOD
Months : 24
From : 3/70
To : 3/72

GRANT or CONTRACT AMOUNT
$ 32,539 *or* 50 %
of eligible project costs.

DESCRIPTION of PROJECT :
The proposed research is:

a. To study the phenomenon of dialysis with a view toward developing a satisfactory theory of selective migration and generating an appropriate mathematical statement;

b. to compare the efficiency of various types of dialysis equipment with respect to selectivity and mobility of solute particles in various media and thereby to develop parameters by which dialyzer membrane and optimal operating conditions can be determined for a number of typical industrial waste streams;

c. to evaluate the economics of dialysis as a tool in removing pollutants from industrial wastes and concentrating them to the extent that recoverability becomes feasible;

d. to design dialysis equipment for continued research and for pilot plant scale studies looking toward industiral applications.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWKR 2 /70 Washington, D.C. 20242

INFORMATION SHEET - - -

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R & D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: C. W. Rice and Company
15 Noble Avenue
Pittsburgh, Pa. 15205

TITLE OF PROJECT: Cost-Effectiveness of Industrial Waste Water Treatment Practices

PROJECT SITE: above

DATE AWARDED: June 28, 1968

FEDERAL CONTRACT: $56,250

TOTAL PROJ. COST: $56,250

PROJECT NUMBER: 14-12-435

PPBS NO: 1202

BRANCH CHIEF:

PROJECT OFFICER:

DESCRIPTION OF PROJECT:

This contract is to obtain estimates of the total expenditures required by specific chemical industries during the next five years to meet (a) state water quality standards and (b) a high percentage removal of each specific pollutant including thermal pollution. The industries covered will include those in the Standard Industrial Categories 2813, 2814, 2815, 2818, and 2871 (Ammonia and Urea only).

The project is scheduled to be completed in October, 1968.

INQUIRIES: Contact the
Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D.C. 20242
3-23

ELD 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Grant awarded under Sec. 6b, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR Engineering-Science, Inc.
150 East Foothills Blvd.
Arcadia, California 91006

TITLE OF PROJECT: "Preliminary Investigation Requirements-Petrochemical & Refinery Waste Treatment Facilities"

PROJECT SITE: Austin, Texas

DATE AWARDED: June 30, 1969

FEDERAL CONTRACT:

TOTAL EST. PROJ. COST: $17,000

PROJECT NUMBER: 12020 EID

PPBS NO. 12020

DESCRIPTION OF PROJECT: This project is to compile, organize, and effectively present the many components which constitute a preliminary wastewater-treatability study. It will be formulated with the intent of serving as a valuable format and source of reference for personnel charged with conducting laboratory and pilot plant programs relative to wastewater treatability including identification of the gaps in the knowledge, and presentation of the descriptions in a form useful by the Water Resources Scientific Information Center. Particular emphasis will be placed on programs where petrochemical and refinery wastewaters are involved, although many aspects of the report will have a much broader applicability.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

WJL/4/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Contract *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical & Allied Products
TITLE of PROJECT : An Inorganic Chemical Profile Study

PROJECT SITE : Pittsburgh, Pa.

GRANTEE or CONTRACTOR
: Cyrus Wm. Rice Division
NUS Corporation
Pittsburgh, Pa. 15205

PROJECT DIRECTOR
: J. K. Rice

PROGRAM NUMBER
: 12020 EJI

GRANT or CONTRACT NUMBER
: 14-12-592

TOTAL ESTIMATED COST
: $55,327

GRANT or CONTRACT AMOUNT
$55,327 *or* 100 %
of eligible project costs.

PROJECT PERIOD
Months : 6 months
From : June, 1969
To : January, 1970

DESCRIPTION of PROJECT :
An industrial waste profile of specific inorganic chemical industries.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 1/70

PPB 1204

PAPER & ALLIED PRODUCTS

12040	TO	GPO	PM
EBY	Oregon State U.-Burgess	R. Scott	G. Webster
DEH	U. of Wash.-McCarthy	R. Scott	G. Webster
EFC	U. of Wash.-Allen	R. Scott	G. Webster
EXQ	U. of Wash.-McCarthy	R. Scott	G. Webster
DLQ	Oregon State U.-Anderson	D. May	G. Webster
DBD	Montana State U.-Sanks	R. Scott	G. Webster
EEL	PMRL of Inst. of Paper Chem.	R. Scott	G. Webster
EMY	The Mead Corp.	R. Scott	G. Webster
ELW	Crown-Zellerbach Corp.	R. Scott	G. Webster
EZZ	N.C. State Univ.	R. Scott	G. Webster
EEK	Georgia-Kraft Co.	R. Scott	G. Webster
EUG	Georgia-Kraft Co.	R. Scott	G. Webster
DYD	International Paper Co.	G. Putnicki	G. Webster
ESV	Crown Zellerbach Corp.	R. Scott	G. Webster
ENC	Interstate Paper Corp.	E. Lomasney	G. Webster
DRY	Continental Can Co. Inc.	G. Putnicki	G. Webster
DKD	Inst. of Paper Chem.	G. Webster	G. Webster
EJU	St. Regis Paper Co.	G. Webster	G. Webster
14-12-162	Electro-optical Systems	C. Brunner	G. Webster
FKS	Weyerhaeuser Co.	K. Willard	G. Webster
FES	S.D. Warren Co.	H. Gorchev	G. Webster
FUB	Green Bay Packaging	R. Scott	G. Webster
FDE	Esleeck Mfg. Co.	E. Conley	G. Webster

PPB 1204

PAPER AND ALLIED PRODUCTS

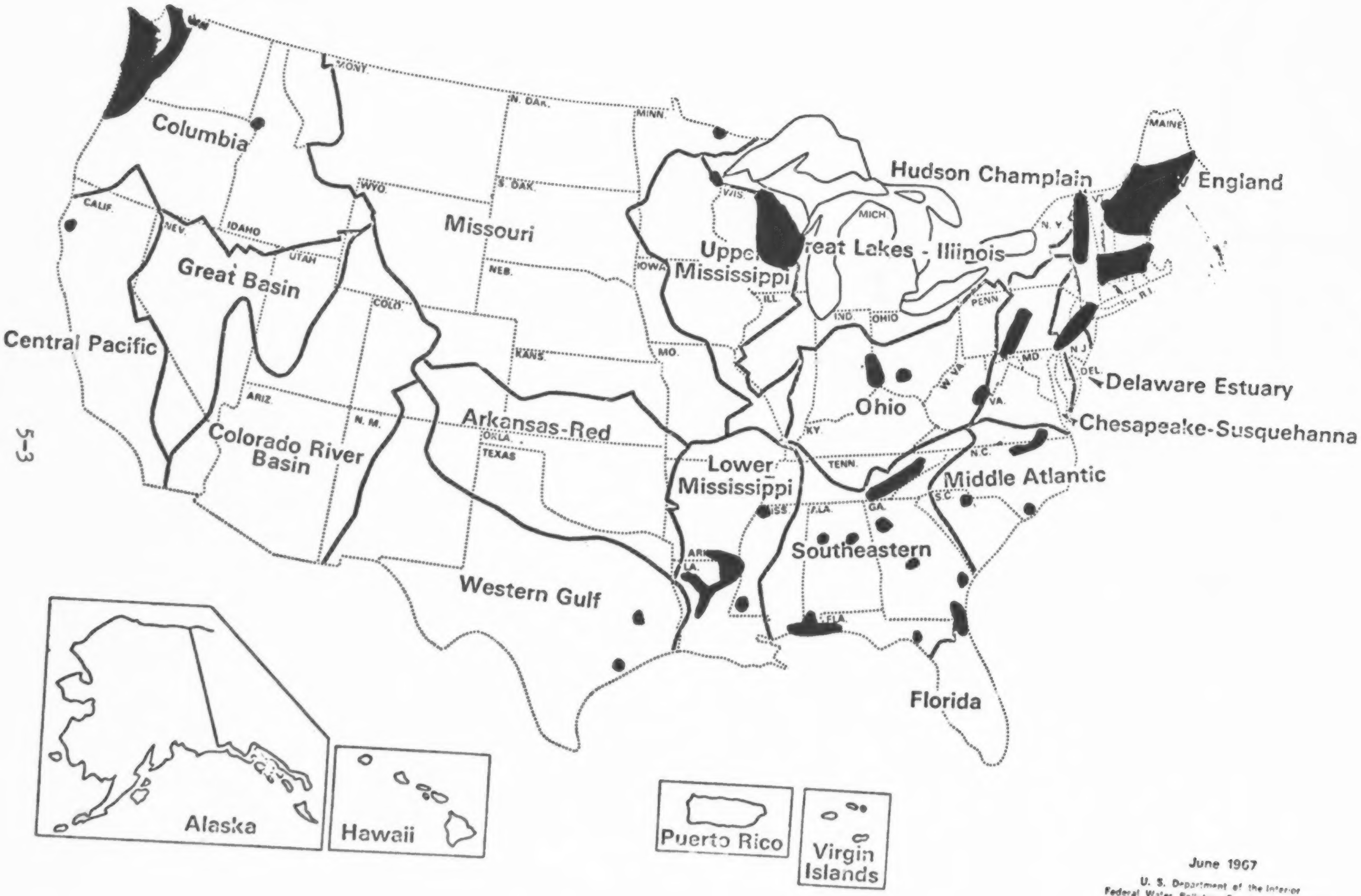
George R. Webster, P.E.
Program Manager

Activities under this subprogram element encompass those industries engaged in the production of pulp, paper, paperboard, and related paper products. Dun and Bradstreet lists 6,683 production establishments under "Standard Industrial Classification" (SIC) number 26 titled "Paper and Allied Products" while Lockwood's Directory indicates there are 542 independent paper mills, 278 paper mills with one or more associated pulp mills, and 32 independent pulp mills. It is toward these 852 production establishments that the effort of FWQA's research and development program is directed. This R&D program is Headquartered in Washington, D. C., but the program support is centered at the Pacific Northwest Water Laboratory in Corvallis, Oregon under the direction of Ralph H. Scott.

It has been estimated that the total waste load originating from this industry represents 27 percent of the total pollutional load attributed to manufacturing. These wastes are characterized by extreme variations in pH and biochemical oxygen demand, BOD, (depending on the pulp production process), high total organic carbon, TOC, and color levels; variations in the organic (fiber), inorganic (fillers), and color (dyes) concentrations depending upon the paper production process.

The R&D program objective is to assist industry in the development of technical, design, operational and economic data on the wastes and new or improved treatment systems for the abatement of pollution from the production processes. Projects for pretreatment, final treatment, joint municipal treatment, in-plant water reuse, and recovery of waste by-products, with the ultimate goal of obtaining a closed loop water system, are being and will be investigated.

LOCATION OF MAJOR PULP & PAPER INDUSTRIES
PPB 1204: Paper & Allied Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Ohio
Middle Atlantic
Southeastern
Florida
Alaska
Hawaii
Puerto Rico
Virgin Islands
CALIF.
NEV.
IDAHO
UTAH
ARIZ.
MONT.
WYO.
COLO.
N. M.
N. DAK.
S. DAK.
NEB.
KANS.
OKLA.
TEXAS
MINN.
IOWA
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ARK.
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WIS.
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OHIO
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PENN.
N. Y.
R.I.
MAINE

June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5R of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Oregon State University
Corvallis, Oregon 97331

PROJECT DIRECTOR: (Name and Address)
Mr. Fred J. Burgess
Head, Department of Civil Engineering
Oregon State University

TITLE OF PROJECT: "Pulp Mill Effluent Disposal"

PROJECT SITE: Corvallis and Newport, Oregon

PROGRAM (PROJECT) NUMBER: 12040 EBY

DATE OFFERED: May 27, 1969

DATE ACCEPTED (AWARDED): June 2, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/1/69 Thru: 5/31/70	$ 20,781	$ 19,237

DESCRIPTION OF PROJECT:

Research will be conducted on predicting the effects of Kraft mill waste disposal in the ocean on the marine environment. A remote sensing system and aerial photography will be utilized to estimate waste concentrations, water currents, diffusion coefficients, and vertical concentration profiles in an ocean outfall plume. Aerial photography will be taken with a multispectral camera system of the waste field. Boat sampling will be conducted at the same time to provide "ground truth" data. Data will be compiled and analyzed by a system of computer analysis which was developed for this purpose in 1968-69.

The investigation will include several Kraft mill outfalls along the Oregon coast. Results of bioassays and chemical analyses will be related to photographic imagery. Zones of water quality influence about existing outfalls and proposed outfalls will be estimated, and diffusion coefficients will be estimated.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242 5-4

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research), of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address) University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR: (Name and Address) Dr. Joseph L. McCarthy
Department of Chemical Engineering
University of Washington
Seattle, Washington 98105

TITLE OF PROJECT: "Studies of Low Molecular Weight Lignin Sulfonates"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 DEH

DATE OFFERED: SEP 26 1969

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Sept. 1, 1969 Thru: Aug. 31, 1970	$33,043	$ 30,661

DESCRIPTION OF PROJECT:

Studies are being undertaken to isolate and characterize low molecular weight lignin sulfonates which are formed from the lignin in wood by action of sulfite pulping process. Improved separation methods by gel chromatography recently developed in this laboratory will be applied to obtain fractions of rather narrow molecular ranges, especially in the low molecular weight range.

Information gained should be of assistance in developing economic uses for the waste liquors from sulfite pulp mills which are giving rise to the hazard of pollution of water sources.

Future studies will be devoted to the following subjects:
1. Separation by get chromatography (Sephadex);
2. Chemical modification of the low molecular weight lignin sulfonate fractions such as acetylation and esterification and separation by chromatographical means;
3. Structural studies with special emphasis upon NMR and mass spectroscopy;
4. Molecular weight determinations by Vapor-Pressure osmometric means.

INQUIRIES: Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research), of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR: (Name and Address)
Dr. G. G. Allan
Associate Professor Fiber Science
College of Forest Resources

TITLE OF PROJECT: "Pollution Abatement by Fiber Modification"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 EFC

DATE OFFERED: May 28, 1969

DATE ACCEPTED (AWARDED): June 10, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: June 69 Thru: May 70 Terminal	$41,603	$37,850

DESCRIPTION OF PROJECT:

The broad aims of this research are:

1. to determine what species, size and shape of molecule can be attached to lignocellulosic fibers using simple reactions compatible with the established processes for the manufacture of fibrous products;
2. to investigate the effect of the attachment of such molecules on the physical properties of fibers and fiber composites, and
3. to use this information to assess the feasibility of reducing water pollution due to pulp liquor discharge by reattaching these waste chemicals to paper and wood fibers.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR:
(Name and Address)
University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR:
(Name and Address)
Dr. Joseph L. McCarthy
Department of Chemical Engineering

TITLE OF PROJECT:

"Steam Stripping of Kraft Pulp Mill Effluent Streams"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 EXQ

DATE OFFERED: SEP 26 1969

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 9/1/69 Thru: 8/31/70	$ 37,429	$ 35,046

DESCRIPTION OF PROJECT:

Three specific aims of the original research program were:

(1) to secure information concerning the nature and concentration of steam-volatile substances present in Kraft pulp mill black liquors and condensates from several process conditions and wood species;

(2) to conduct further laboratory experiments and SEKOR process design studies in order to evaluate alternate ways of operating the SEKOR process and optimize the process;

(3) to conduct laboratory and process design studies directed toward evaluating procedures of separating SEKOR "oils" on an industrial scale for market sales.

In addition to continuing research toward the above objectives, it is also planned to conduct research at the University in close collaboration with SEKOR-related studies being done by industry.

INQUIRIES: ~~Contact Project Coordinator~~ Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12040 DLQ - 2nd year

TITLE OF PROJECT: Slime Growth Evaluation of Treated Pulp Mill Wastes

GRANTEE:
Oregon State University
Department of Microbiology
Corvallis, Oregon 97331

PROJECT DIRECTOR:
A. W. Anderson
Department of Microbiology
Oregon State University
Corvallis, Oregon 97331

Project Site: Corvallis, Oregon

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 1, 1970

Project Cost: $16,965

Completion Date: May 31, 1970

Federal Cost: $15,415

DESCRIPTION OF PROJECT

This is a continuation of a project initiated in 1969. The objective of this research is to evaluate the slime growth promoting potential of treated pulp mill wastes. Wastes treated by various means will be tested for their ability to support slime growth using various procedures. Additional studies will be carried out in an effort to define specific carbon and nitrogen sources in treated wastes which support the growth of Sphaerotilus. The effects of environmental factors on growth of Sphaerotilus also will be examined. This study will contribute to the development of abatement procedures for controlling slime growth as well as assist in establishing suitable water quality criteria for streams receiving pulp mill wastes. The study also will add to the knowledge on Sphaerotilus.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5R *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

***INDUSTRIAL CODE*:** Paper and Allied Products

***TITLE of PROJECT*:** "Color and Mineral Removal from Kraft Bleach Wastes"

GRANTEE or CONTRACTOR : Montana State University Bozeman, Montana 59715	***PROJECT DIRECTOR*** : Dr. Robert L. Sanks
PROGRAM NUMBER : 12040 DBD	***PROJECT SITE*** : Bozeman, Montana
TOTAL ESTIMATED COST : $39,180	***PROJECT PERIOD*** *Months* :
GRANT or CONTRACT AMOUNT $ 34,000	*From* : June 1, 1970 *To* : May 31, 1971

***DESCRIPTION of PROJECT*:**

The broad objective of this research project is to determine the economic potential of synthetic resins for the control of pollution from kraft bleach wastes in reuse systems.

More specifically, the objectives are: (1) to explore the use of synthetic resins for the removal of color and other refractory organic contaminants, (2) to optimize the operation of fixed resin beds for sorption and also for demineralization, (3) to seek economical regenerating methods and innocuous means of waste disposal, (4) to compare the relative effectiveness and economy of resins with carbon, and (5) to estimate the cost of wastewater renovation, reuse, and recycle using resins either alone or with other aids.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWSR 5/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Pulp Manufacturers Research League, Appleton, Wisconsin

TITLE OF PROJECT: Development of Reverse Osmosis for In-Plant Treatment of Dilute Pulping Industry Wastes.

PROJECT SITE: 6 mills to be used

DATE AWARDED: September 26, 1967

FEDERAL GRANT: $483,371

TOTAL EST. PROJ. COST: $690,530

PROJECT NUMBER: WPRD 12-01-68
12040 EEL

PPBS NO. 1204

DESCRIPTION OF PROJECT:

The project will determine the ability of reverse osmosis technology to both produce a product water suitable for re-use in mill processes, and a concentrate available for by-product recovery or for treatment prior to discharge. Wastes to be handled, at separate mills, will include weak sulfite washings, weak Kraft washings, bleach wastes, condensates and semi-chemical wastes. The semi-trailer housed reverse osmosis equipment will be transported to separate mills for the experimental work. Presently projected mill sites are located in Wisconsin and Minnesota. Others are to be selected.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: The Mead Corporation
Chillicothe, Ohio

TITLE OF PROJECT: "Evaluation of Role of High Rate Trickling Filters and Aeration Devices Separately and in Combination for the Advanced Biological Treatment of Integrated Kraft Pulp and Paper Mill Effluents"

PROJECT SITE: Chillicothe, Ohio

DATE AWARDED: December, 1966

FEDERAL GRANT: $299,950 or 70% of project

TOTAL EST. PROJ. COST: $428,500

PROJECT NUMBER: WPRD 55-01-67
12040 EMY

PPBS NO. 1204

DESCRIPTION OF PROJECT: The pulp and paper industry needs to find an alternative treatment process which is less expensive and difficult-to-operate than the conventional activated sludge process. As a step in this direction, this project will involve the continuous operation of a pilot treatment plant containing plastic trickling filter, brush-aerated oxidation ditch, conventional aerated lagoon, deep aerated lagoons, and two clarifiers in combinations and evaluate possible efficiencies.

The specific research objectives are to: determine the effect of influent quality on biological treatment; evaluate potential of plastic trickling filters alone and in combination with brush-aerated oxidation ditch, conventional aerated lagoon and deep aerated lagoon; and to achieve higher-than-conventional BOD removals from kraft mill wastes.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible]
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Crown Zellerbach Corp., Camas, Washington.

TITLE OF PROJECT: Economic Optimization of Secondary Treatment and Determination of Load to Control Biological Growths in a Stream.

PROJECT SITE: Lebanon, Oregon

DATE AWARDED: 12-5-67 (O&A)

FEDERAL GRANT: $503,739

TOTAL EST. PROJ. COST: $802,000

PROJECT NUMBER: WPRD 69-01-68
12040 ELW

PPBS NO. 1204

DESCRIPTION OF PROJECT:

This project will seek to determine the costs of mechanically aerated lagoon treatment of pulp mill and paper mill wastes by examining in detail the comparison of retention time, aerated logoon depth, basin configuration, recycle and parallel versus series operation of two lagoons. Information will also be obtained concerning treatment achieved by multiple lower hp surface aerators compared to two high hp units. Further, the project will, by use of test streams, seek to determine the degree of treatment needed to prevent slime growth in the receiving stream.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.~~W.
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: N. Carolina State University, Raleigh, N. C.

TITLE OF PROJECT: Filtration of Kraft Pulp Liquor through Chips

PROJECT SITE: Raleigh, N. C.

DATE AWARDED: 8-4-67 (O&A)

FEDERAL GRANT: $18,144

TOTAL EST. PROJ. COST: $25,920

PROJECT NUMBER: WPRD 115-01-68
12040 EZZ

PPBS NO. 1204

DESCRIPTION OF PROJECT:

The project is directed toward a determination of the decrease in pollutional load that may be gained by filtration of weak Kraft washings through wood chips just prior to their entry into the pulping process.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Georgia-Kraft Co., Rome, Ga.

TITLE OF PROJECT: Treatment of Selected Internal Kraft Mill Wastes in Cooling Tower

PROJECT SITE: Macon, Georgia

DATE AWARDED: 8-7-67 (O&A)

FEDERAL GRANT: $287,000

TOTAL EST. PROJ. COST: $411,000

PROJECT NUMBER: WPRD 116-01-68
12040 EEK

PPBS NO. 1204

DESCRIPTION OF PROJECT:

This project will determine the ability of cooling towers to both permit heat dissipation and recycle of waste water back to the condensers as well as the treatment efficiency that may be provided by passage of waste waters through the tower. Condensates and decker filtrate will be handled by this facility. Organic load reduction will probably be gained by a combination of chemical oxidation, air stripping of volatile constituents and biochemical oxidation.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Georgia-Kraft Co., Rome, Ga..

TITLE OF PROJECT: Treatment of Kraft Mill Effluent by Foam Separation

PROJECT SITE: Rome, Ga.

DATE AWARDED: 8-4-67

FEDERAL GRANT: $48,181

TOTAL EST. PROJ. COST: $68,830

PROJECT NUMBER: WPRD 117-01-68
12040 EUG

PPBS NO. 1204

DESCRIPTION OF PROJECT:

The project is directed toward an examination of the possible separation, in the foam phase, of a significant portion of the dissolved organics contained in primary treated Kraft Mill waste. Hopefully it may be discovered that a high percent of the pollutional load may be separated in a relatively small volume by these means. This may then provide a larger volume of 'bottoms' suitable for discharge and a smaller volume of 'tops', or collapsed foam, directed to complete treatment.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
8/68 *Federal Water Pollution Control Administration*
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: International Paper Company
220 East 42nd Street
New York, New York 10017

TITLE OF PROJECT: "Evaluation and Demonstration of the Massive Lime Process for the Removal of Color from Kraft Pulp Mill Wastes."

PROJECT SITE: Springhill, Louisana **DATE AWARDED:** JUN 14 1968

FEDERAL GRANT: $595,000 **TOTAL EST. PROJ. COST:** $850,000

PROJECT NUMBER: WPRD-135-01-(R-1)-68 **PPBS NO.** 1204
12040 DYD

DESCRIPTION OF PROJECT:

International Paper Company proposes to isolate wastes from the caustic extraction stage of a Kraft pulp bleaching line and the unbleached decker of the pulp mill, and to treat these wastes separately and combined for the removal of color and reduction of biochemical oxygen demand by the Massive Lime Process over a period of 27 months.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible]
Washington, D. C. 20242

GRW/5-68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Crown Zellerbach Corporation
1 Bush Street
San Francisco, California 94119

TITLE OF PROJECT: "A Demonstration Plant Evaluation of Four Methods for Pulp and Paper Mill Sludge Utilization and Disposal"

PROJECT SITE: Camas, Washington

DATE AWARDED: April 3, 1968

FEDERAL GRANT: $350,000

TOTAL EST. PROJ. COST: $848,320

PROJECT NUMBER: WPRD 144-01-68
12040 ESV

PPBS NO. 1204

DESCRIPTION OF PROJECT:

This demonstration study is a full-scale investigation of four methods of utilization and disposal of primary sludge from a combined pulp and paper mill. The areas of investigation are: disposal by incineration, utilization as "hog-fuel" make-up in a conventional steam boiler at rates ranging between 5 and 50%, use as a dried mulching material for highway slope preparation and the evaluation of sludge as an agricultural soil conditioner.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Interstate Paper Corporation
300 East 42nd Street
New York, New York 10017

TITLE OF PROJECT: "Chemical Coagulation Color Removal System for Kraft Mill Effluents"

PROJECT SITE: Riceboro, Georgia

DATE AWARDED: June 27, 1968

FEDERAL GRANT: $466,895

TOTAL EST. PROJ. COST: $741,160

PROJECT NUMBER: WPRD-183-01-68
12040 ENC

PPBS NO. 1204

DESCRIPTION OF PROJECT: This project proposes to develop, install, and demonstrate a new chemical coagulation process for removing color from kraft pulp and paper mill effluents. The process uses a stoichiometric lime addition to the untreated wastes, prior to primary sedimentation, which adsorbs the color bodies onto the lime floc and is settled with the sludge. This sludge is then removed to lagoons for drying and storage.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242 5-18

GRW:5/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Continental Can Company, Inc.
Paperboard and Kraft Paper Division
Hodge, Louisiana 71247

TITLE OF PROJECT: "A Color Removal and Fibrous Sludge Disposal Process for the Kraft Paper Industry"

PROJECT SITE: Hodge, Louisiana

DATE AWARDED: JUL 25 1968

FEDERAL GRANT: $750,000.00

TOTAL EST. PROJ. COST: $2,865,970

PROJECT NUMBER: WPRD-240-01-68
12040 DRY

PPBS NO. 1204

DESCRIPTION OF PROJECT: The two year project will develop economical design and operational data applicable to the Kraft pulp and paper industry in removal of color in mill effluents, and disposing of fibrous sludges. Color removal will be accomplished by lime precipitation of the color bodies and fibers, with subsequent regeneration of the lime by sludge combustion in a kiln.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Institute of Paper Chemistry
Appleton, Wisconsin 54911

TITLE OF PROJECT: "Chemical and Physical Nature of Color Bodies in Kraft Mill Effluents Before and After Treatment"

PROJECT SITE: Appleton, Wisconsin

DATE AWARDED: DEC 31 1968

FEDERAL GRANT: $119,504.70

TOTAL EST. PROJ. COST: $170,721

PROJECT NUMBER: 12040DKD

PPBS NO. 1204

DESCRIPTION OF PROJECT:

Kraft pulping wastes which are discharged into streams may darken the color of the water, contribute to the biochemical oxygen demand and increase the solids content of the stream. New federal and state water standards will require removal of such materials from mill effluents. Lime precipitation in small scale operations has been shown to remove certain of the solid constituents and demonstration grants on lime treatments have been approved at three kraft mill sites.

The objective of the proposed project is to determine the chemical and physical nature of the color bodies in the effluents from these three kraft mills both before and after lime treatment. The investigation should lead to a better understanding of the results of the lime treatments, and may suggest means for more complete removal of color.

INQUIRIES: *Contact the* Industrial Pollution Control Branch - DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section Six of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
St. Regis Paper Company
150 East 42nd Street
New York, New York 10017

PROJECT DIRECTOR: (Name and Address)
Mr. Roy L. Miller
Post Office Box 1591
Pensacola, Florida 32502

TITLE OF PROJECT: "The Production and Use of Activated Carbon for Water Renovation in Kraft Pulp and Paper Mills"

PROJECT SITE: Jacksonville and Pensacola, Florida; and West Nyack, New York

PROGRAM (PROJECT) NUMBER: 12040 EJU

DATE OFFERED: JUN 1 3 1969

DATE ACCEPTED (AWARDED): JUN 2 5 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6-30-69 Thru: 6-30-72	$1,461,562	$878,472

DESCRIPTION OF PROJECT:

St. Regis Paper Company proposes a program for the development of an economical system for maximum water reuse in the kraft pulp and paper industry as a means of water pollution control and conservation. This program is based on two concepts. The first is an effluent treatment cycle using activated carbon and the second is on-site carbon production and activation from readily available raw materials with full integration into the kraft mill recovery and power systems to achieve the lowest net cost of activated carbon.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT ~~GRANT~~ CONTRACT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Contract *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: Electro-Optical Systems, Inc.
300 North Halstead St.
Pasadena, California 91107

TITLE OF PROJECT: "Plasma Arc Processing of Spent Sulfite Liquors"

PROJECT SITE: Pasadena, California

DATE AWARDED: May 16, 1968

FEDERAL GRANT: $49,945.00

TOTAL EST. PROJ. COST: $49,945.00

PROJECT NUMBER: 14-12-162

PPBS NO. 1204

DESCRIPTION OF PROJECT: To determine the technical and economic feasibility of plasma arc treatment of sulfite waste liquors.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
Washington, D. C. 20242

GRW 1/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Paper and Allied Products
TITLE of PROJECT : "Steam Stripping and Rectification of Kraft Pulp Mill Condensates and Black Liquors"
PROJECT SITE : Longview, Washington

GRANTEE or CONTRACTOR
Weyerhaeuser Company
Longview, Washington 98632

PROJECT DIRECTOR
: John Van Vessen
Weyerhaeuser Company
Longview, Washington 98632

PROGRAM NUMBER
: 12040 FKS

GRANT or CONTRACT NUMBER
: 12040 FKS

TOTAL ESTIMATED COST
: $183,905

PROJECT PERIOD
Months : 24
From : April 1, 1970
To : March 31, 1972

GRANT or CONTRACT AMOUNT
$ 128,733 *or* 70.0 *%*
of eligible project costs.

DESCRIPTION of PROJECT :

A pilot plant stripping unit will be designed and built. This will be installed along with auxilliary equipment for rectification and storage. Runs will be made using Decanter underflow; Blow condensate; Evaporator condensate and Black liquor. The stripping bottoms water will be tested and then sewered. The overhead which forms two immiscible liquids when condensed, will be decanted, forming a crude turpentine product and a water soluble organic layer. This will be further rectified and processed to evaluate the worth of the products therein. The main objective is to determine on a large pilot plant scale (50 gal/min. stripping unit) the efficiency and effectiveness of a steam stripping-rectification unit in reducing the volatile organic chemicals in the Kraft process condensate streams. this reduction is directly proportional to the biochemical oxygen demand reduction that can be achieved by this process. The mass transfer data provided by this stripping and rectification equipment, along with the economics of any by-products derived is necessary for further decisions regarding full scale units.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWXR 1/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6 (b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: Sludge Disposal and Material Recovery System for Manfacturers of Coated and/or Filled Papers.

GRANTEE or CONTRACTOR
: S. D. Warren Co.
89 Cumberland Street
Westbrook, Maine 04092

PROJECT DIRECTOR
: Richard Labrecque
S. D. Warren Co.

PROGRAM NUMBER
: 12040 FES

PROJECT SITE
: Westbrook, Maine

TOTAL ESTIMATED COST
: 65,875

GRANT or CONTRACT AMOUNT
$45,058

PROJECT PERIOD
Months : 12 months
From : May 15, 1970
To : May 15, 1971

DESCRIPTION of PROJECT:

The objective of this 12 month project is to evaluate the effectiveness of a pyrolysis process for the recovery and subsequent reuse of pigment from the dewatered sludge of a paper mill primary waste treatment system.

The major project activities will include, the installation of a grit removal system, the production of 3 tons of recovered pigment in a pilot plant rotary kiln, quality analysis of the recovered pigments, a paper production run using the recovered pigment and an evaluation of the effectiveness of the total process.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWKR 4/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: "Closure of Water Use Loop in NSSC Pulp and Paperboard Mill Utilizing R-O as a Unit Operation"

GRANTEE or CONTRACTOR
: Green Bay Packaging, Inc.
Post Office Box 1107
Green Bay, Wisconsin 54305

PROJECT DIRECTOR
: William R. Nelson
Director Corporate Development
Green Bay Packaging, Inc.

PROGRAM NUMBER
: 12040 FUB

PROJECT SITE
: Green Bay, Wisconsin

TOTAL ESTIMATED COST
: $1,582,400

PROJECT PERIOD
Months : 42
From : June 15, 1970
To : December 15, 1973

GRANT or CONTRACT AMOUNT
$ 757,033

DESCRIPTION of PROJECT:

The objective of this 42 month project is to demonstrate the full scale mill conditions resulting from maximum closure of a pulp and paperboard mill wastewater loop. The closed loop system will utilize a 720,000 gpd R-O unit as the treatment process and a fluidized bed incinerator as the disposal technique.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWKR 4/27 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant ***awarded under Section*** 6(b) ***of the Federal Water Pollution Control Act (PL 84-660), as amended.***

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: "Treatment Plant for Flocculation and Microscreening of Whitewater"

GRANTEE or CONTRACTOR
: Esleeck Manufacturing Co. &
Strathmore Paper Co.
Turner Falls, Mass.

PROGRAM NUMBER
: 12040 FDE

TOTAL ESTIMATED COST
: $605,400

GRANT or CONTRACT AMOUNT
$252,345

PROJECT DIRECTOR
: Mr. John S. Mudgett
Strathmore Paper Co.
West Springfield, Mass

PROJECT SITE
: Turners Falls, Mass

PROJECT PERIOD
Months : 24 months
From : June 24, 1970
To : June 24, 1972

DESCRIPTION of PROJECT:

The objectives of this grant are to investigate the applicability of microscreening of paper mill wastes from two paper mills manufacturing business, technical and other papers made from either rag or chemical wood pulps to determine the removal of biochemical oxygen demand (BOD), suspended solids, color and turbidity. Tests will be run utilizing a coagulant or coagulant aid, such as a polyelectrolyte, for the further removal of turbidity from the mocroscrcener effluent. Evaluations to determine the possibility of reclaiming fibers from the microscreener sludge will be done. Appropriate treatment processes, such as centrifugation or sedimentation may enable the mills to economically recover lost fibers.

Data will be obtained to determine design factors and estimates of the cost of construction and operation of such a facility. The cost of operation will be correlated with the retail market value of the product. Also the study will conduct tests on a ultra-filter supplied free of charge by the FWPCA.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
IPDWKR 4/70 ***Washington, D.C. 20242***

PPB 1205

PETROLEUM & COAL PRODUCTS

12050	To	GPO	PM
DIT	Texas A&M Res. Fdn.	L. Lively	G. Rey
DKF	U. of Oklahoma-Reid	L. Myers	E. Dulaney
DRC	Ill. Inst. of Tech.	C. Risley	E. Dulaney
DXR	Harvard U.-Speilman	R. Keppler	E. Dulaney
EKT	Amercian Oil Co.	O. Olsen	G. Rey
DSH	Am. Petroleum Inst.	P. Lefcourt	E. Dulaney
DML	American Oil Co.	C. Risley	G. Rey
DMT	Engineering Science	W. Horn	G. Rey
FDK	Archer Daniels Midland	C. Risley	G. Rey
EZG	Shell Oil Co.	L. Myers	E. Dulaney

PPB 1205

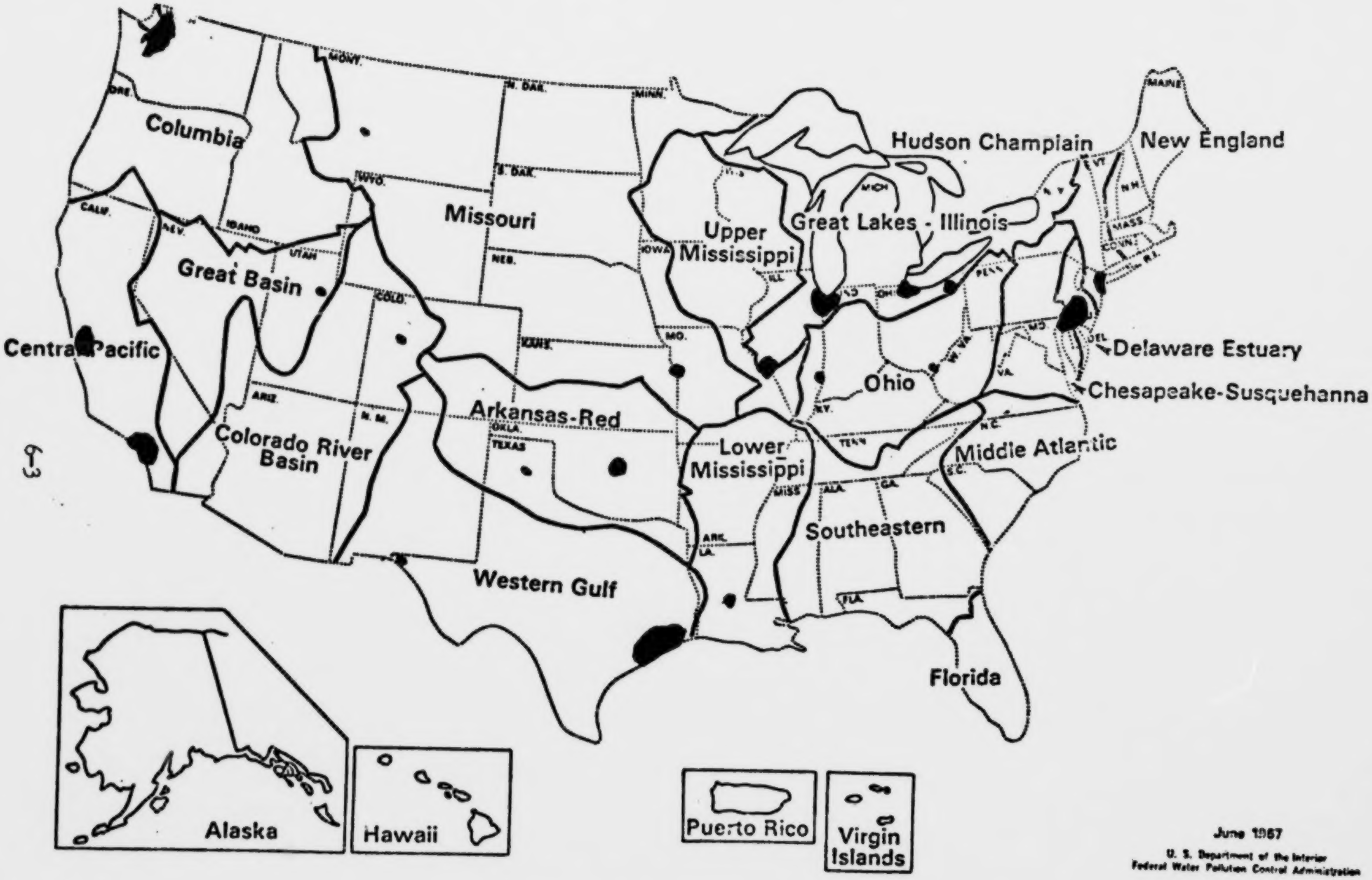
PETROLEUM & COAL PRODUCTS

E.L. Dulaney, P.E.

The petroleum refining industry is by far the larger water user in this subprogram element. The industry uses 17 billion gallons of water per day or 20% of total industrial water usage. Approximately 0.23 billion gallons per day is used in processing operations. Many distinct operations such as crude oil distillation, reforming, catalylic cracking, thermal cracking, polymerization, alkalation, gasoline and middle distillate treating, motor oil manufacturing, etc. are utilized. Foul condensate is usually pretreated at the source but by and large the refiners depend on central waste treatment facilities for pollution control. Oil separation and recovery followed by biological conversion of phenols, sulfides, etc. are the treatment techniques most frequently employed. Greater emphasis on more effective treatment, waste treatment at the source, product recovery, water reuse, and development of treatment methods requiring less land areas is needed.

Over 500 million tons per year of coal is obtained by strip and deep mining operations in the U.S. Approximately one-half of this output is consumed by the Utility and Steel Industries. Over 80% of the coal is cleaned and classified by using water as the cleaning medium prior to marketing. Among the most troublesome wastes from coal processing and use are coal fines, sulfur, phenols, ammonia, and thermally polluted waters. For FWQA R&D Program administration purposes mine drainage problems are assigned to subprogram PPB 1401 Mine Drainage, thermal pollution problems are assigned to PPB 1603 Thermal Pollution, and wastes from coal coking operations are assigned to PPB 1201 Metal and Metal Products since the majority of coal coking is accomplished as an integral part of steel mill operations.

LOCATION OF MAJOR PETROLEUM REFINERIES
PPB 1205: Petroleum & Coal Products


Columbia
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Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Ohio
Delaware Estuary
Chesapeake-Susquehanna
Middle Atlantic
Southeastern
Florida
Alaska
Hawaii
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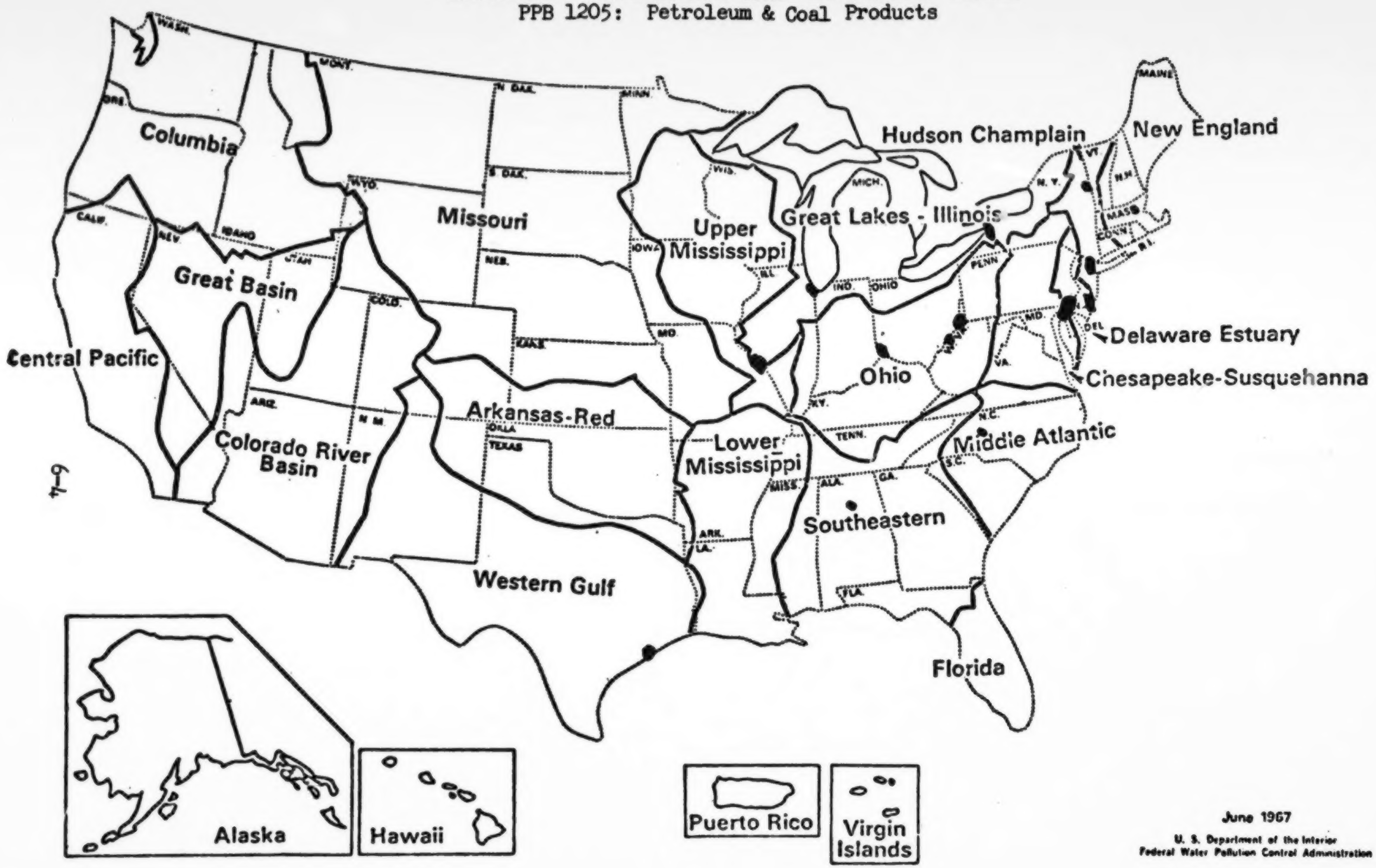
June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

LOCATION OF INTERMEDIATE COAL TAR PRODUCTS PLANTS
PPB 1205: Petroleum & Coal Products


Columbia
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Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Ohio
Middle Atlantic
Southeastern
Florida
Alaska
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June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Texas A&M Research Foundation

TITLE OF PROJECT: "Metal Ion-Catalyzed Oxidation of Phenols and Aromatic Amines"

PROJECT SITE:	Texas A&M	**DATE AWARDED:**	October 14, 1968
FEDERAL GRANT:	$40,265	**TOTAL EST. PROJ. COST:**	$234,000
PROJECT NUMBER:	WP 01179-03 12050 DIT	**PPBS NO.**	1205

DESCRIPTION OF PROJECT: A Study of the mechanism and feasibility of metal ion-catalyzed oxidation of phenols and aromatic amines by molecular oxygen in wastewater systems partially treated with potassium permanganate.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
University of Oklahoma Research Institute
1808 Newton Drive
Norman, Oklahoma 73069

PROJECT DIRECTOR: (Name and Address) Prof. George Reid

TITLE OF PROJECT: State-of-the-Art Evaluation on Petroleum and Coal Wastes

PROJECT SITE: Norman, Oklahoma

PROGRAM (PROJECT) NUMBER: 12050 DKF

DATE OFFERED:

DATE ACCEPTED (AWARDED): Jan. 8, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/15/68 Thru: 10/14/69	$17,897	$14,297

DESCRIPTION OF PROJECT:

The objective of this project is to develop a state of art report on the characteristics of oil and coal wastes. The study will include the procedures used by industry for aggrigating and handling these wastes and will determine the applicability and efficiencies of various treatment processes. Literature surveys, personal interviews and field studies will be used to define future research needs.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS II Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Petroleum and Coal Products
TITLE of PROJECT : Efficiency of Fibrous Bed Coalescers

PROJECT SITE : Chicago, Illinois

GRANTEE or CONTRACTOR	*PROJECT DIRECTOR*
: Illinois Institute of Technology Chicago, Illinois 60616	: Dr. W. M. Langdon Dr. D. T. Wasan
PROGRAM NUMBER	*GRANT or CONTRACT NUMBER*
: 12050 DRC (2nd year)	:
TOTAL ESTIMATED COST	*PROJECT PERIOD*
: $41,665	*Months* : 12
GRANT or CONTRACT AMOUNT	*From* : June 1, 1970
$34,998.60 *or* 84.0 % *of eligible project costs.*	*To* : May 31, 1971

DESCRIPTION of PROJECT : This project will produce a design for a complete 50 gpm coalescer unit utilizing the mathematical model developed during the first year. This design will be used to construct and test a 150 ml/min demonstration unit which will be operated on an actual industrial waste stream. The program will consist of the preparation of general plans, specifications, explanations, costs estimates, and a discussion of the anticipated performance in recovering finely-divided, insoluble liquid pollutants from the selected industrial source. The design must not only be effective and economical but also capable of adaption to the many different types of pollutants and conditions that may arise. The waste source for the bread-board demonstration unit will be a steel plant hot mill effluent before (100 ppm oil in water) and after (10 ppm oil in water) treatment at the plant.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
✓ *Federal Water Pollution Control Administration*
LRDWKR 4/70 *Washington, D.C. 20242*

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant , under Section 5 R of the , Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
President & Fellows of Harvard College
Office of Research Contracts
1350 Massachusetts Avenue
Cambridge, Mass. 02138

PROJECT DIRECTOR: (Name and Address)
Dr. Lloyd A. Speilman
Pierce Hall - Room 124
Harvard University
Cambridge, Mass 02138

TITLE OF PROJECT: "Oil Dispersion Coalescence by Porous Solid Contact"

PROJECT SITE: Cambridge, Mass.

PROGRAM (PROJECT) NUMBER: 12050 DXR

DATE OFFERED: September 2, 1969

DATE ACCEPTED (AWARDED): Oct. 1, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Sept. '69 Thru: Aug 31, '70	$ 16,157	$15,349

DESCRIPTION OF PROJECT: This project will be directed at clarifying the fundamental mechanisms underlying bed coalescense and the formulation of general design criteria through a mathematical description of pressure drop and coalescense performance. The formulation will be guided by the experimental determination of the extent of phase separation and pressure drop under controlled variation of inlet drop size, suspension chemistry, median grain size, bed depth, flow rate, and grain surface treatment. The results of this work should be of use in the design of separation processes for treating aqueous oil dispersions.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242 6-8

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: American Oil Company
910 S. Michigan Avenue
Chicago, Illinois 60680

TITLE OF PROJECT: Fluid-Bed Incineration of Petroleum Refinery Waste

PROJECT SITE: Mandan, North Dakota **DATE AWARDED:** May, 1968

FEDERAL GRANT: $170,265 **TOTAL EST. PROJ. COST:** $354,530

PROJECT NUMBER: WPRD-215-01-68
12050 EKT
PPBS NO. 1205

DESCRIPTION OF PROJECT:

The project consists of: (1) the design and construction of a fluid-bed incineration system for treatment of refinery chemical and oil sludge wastes, and (2) the operation and evaluation of the system as a means of treating the refinery wastes.

Capacities up to 70 barrels per day, at full scale, are to be processed. The identity of operating problems and the limitations of the system are to be determined. The cost of treatment of the refinery waste by the proposed method will be developed for the system as optimized during the demonstration period.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
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Washington, D. C. 20242

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INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: American Petroleum Institute
Air and Water Conservation
1271 Avenue of the Americas
New York, New York 10020

TITLE OF PROJECT: "Improved Capabilities of Biological Systems to Assimilate Oil"

PROJECT SITE: New York, New York

DATE AWARDED: June 20, 1968

FEDERAL GRANT: $51,470

TOTAL EST. PROJ. COST: $84,990

PROJECT NUMBER: WPRD 243-01-68
12050 DSH

PPBS NO. 1205

DESCRIPTION OF PROJECT:

The project will consist of a study of laboratory scale activated sludge waste treatment systems which will be operated to determine their tolerance to various types and amounts of hydrocarbons, the nature of the interference of the hydrocarbons, the fate of the hydrocarbons in the system, and to study methods for improving pretreatment of the influent and of improving the operation of the systems.

The work will be performed by Hydroscience, Inc. under the direction of an API Task Force. The project period will be 1 year.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~.
Washington, D. C. 20242

ELD/5-68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: American Oil Company
910 South Michigan Avenue
Chicago, Illinois

TITLE OF PROJECT: "Treatment of Refinery Effluent by a Unique Combination of Biological and Chemical Processes.

PROJECT SITE: Whiting, Indiana

DATE AWARDED: February 20, 1969

FEDERAL GRANT: $336,535

TOTAL EST. PROJ. COST: $1,737,775

PROJECT NUMBER: 12050 DML

PPBS NO. 1205

DESCRIPTION OF PROJECT:

A 30 MGD scale project to demonstrate the advantages of using chemical coagulation and air flotation following biological conditioning to provide refinery effluent of high quality. To establish what operating flexibilities exist in such combination processing and the costs associated therewith. To evaluate a number of unique design features, including a hitherto unproven process for disposal of oily sludges, a unique and low-cost method for preventing sludge deposition in an aerated lagoon, a novel application of rotary-drum skimmers and a comparative study of alternate design features for air flotation.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET - - -

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R & D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Engineering Science, Inc.
150 East Foothill Blvd.
Arcadia, California 19006

TITLE OF PROJECT: The Characteristics and Pollutional Problems Associated with Petrochemical Wastes

PROJECT SITE: Austin, Texas

DATE AWARDED: Sept. 25, 1968

FEDERAL CONTRACT: $11,190.00

TOTAL PROJ. COST: $11,190.00

PROJECT NUMBER: 14-12-461
12050 DMT

PPBS NO: 1205

BRANCH CHIEF: William J. Lacy

PROJECT OFFICER: George Rey

DESCRIPTION OF PROJECT: The general scope of the project as developed under the Plan of Operation shall include a detailed development of the following:

1. History and Projection of petrochemical industry;
2. Definition, magnitude, and pollutants associated with these waste treatment problems;
3. Evaluation of control, treatment and disposal practices;
4. Listing of the special legal problems involved with petrochemical waste management;
5. Economic feasibility of present and future control methods, reflecting down stream uses; and
6. Evaluation of research needs.

The objectives of this proposed project will be achieved through a well coordinated plan of operation. A complete literature review shall be conducted using the numerous volumes available in the Engineering, Chemistry, Biology, and personal libraries located on the University of Texas campus. Additional information shall be obtained from various governmental agencies and selected industries. Additional data derived from the unpublished Environmental Health Engineering Reports shall be utilized.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D.C. 20242
6-12

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: Archer Daniels Midland Company
(Name and Address) 4666 Faries Parkway
Decatur, Illinois 62525

PROJECT DIRECTOR: R. S. White
(Name and Address) (as above)

TITLE OF PROJECT: "ADM Company Waste Water Treatment"

PROJECT SITE: Decatur, Illinois

PROGRAM (PROJECT) NUMBER:
12050 FDK

DATE OFFERED: February 18, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/70 Thru: 6/71	$245,254	$106,677

DESCRIPTION OF PROJECT:

A full scale (~0-5 MGD) development-demonstration project for emulsion breaking of the effluent wastewaters resulting from soybean processing for oil. The project will develop and install the required additional facilities to break tight emulsions currently being discharged to a municipal sewer system. The existing system contains an oil separator-skimmer, and 1 day retention lagoon. To be explored will be primarily a two stage chemical system, with other physical and biological alternatives also to be evaluated. Also to be demonstrated is an ion exchange system, for sodium removal and wash water recovery, as researched by the USDA.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Petroleum & Coal Products

TITLE of PROJECT: "Demonstration of Oily Waste Disposal by Soil Cultivation Process"

GRANTEE or CONTRACTOR
: Shell Oil Company
P. O. Box 100
Deer Park, Texas 77536

PROJECT DIRECTOR
: M. L. Renquist
P. O. Box 100
Deer Park, Texas 77536

PROGRAM NUMBER
: 12050 EZG

PROJECT SITE
: Deer Park, Texas

TOTAL ESTIMATED COST
: $100,000

GRANT or CONTRACT AMOUNT
$ 70,000

PROJECT PERIOD
Months : 22
From : March 18, 1970
To : January 18, 1972

DESCRIPTION of PROJECT:

The project will consist of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots will be operated at specific nutrient addition levels. The objectives will be to determine:

1. Decomposition rates of various types of oily waste sludges
2. Effectiveness of adding nutrient supplements
3. Major microbiological species active in the soil
4. The cost of the process for the disposal of oily waste
5. Depth of oil penetration into the soil

The demonstration phase will follow a six month pilot phase for optimization of waste loading rates and nutrient addition.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 1/70

PPB 1206

FOOD & KINDRED PRODUCTS

12060	To	GPO	PM
1486	U. of Wash. - Carlson	J. Boydston	G. Keeler
ECF	Oregon State U.	K. Dostal	G. Keeler
EDK	National Canners Asso.	W. Pierce	G. Keeler
EGU	Ohio State U. Res. Fdn.	E. Harris	G. Keeler
DSI	Beet Sugar Development Fdn.	K. Dostal	G. Keeler
93	Beet Sugar Development Fdn.	J. Boydston	G. Keeler
EHS	Melbourne Water Sci. Inst.	K. Dostal	G. Keeler
FDR	U. of Puerto Rico	E. Lomasney	G. Keeler
3	RAI Research Corp.	A. Richardson	G. Keeler
EHV	R.T. French Co.	J. Boydston	G. Keeler
EZP	FMC Corp.	C. Swanson	G. Keeler
38	Minute Maid Co.	D. Hill	G. Keeler
FAK	Beet Sugar Dev. Fdn.	R. Scott	G. Keeler
EHT	North Star R&D Inst.	K. Dostal	G. Keeler
EUB	John Morrell & Co.	J. Witherow	G. Keeler
FAG	Vahlsing, Inc.	H. Pahren	G. Keeler
FAD	Snokist Growers	J. Boydston	G. Keeler
EHU	National Canners Asso.	W. Pierce	G. Keeler
151	National Canners Asso.	W. Pierce	G. Keeler
EZY	Winter Garden Citrus Co-op	D. Hill	G. Keeler
DQV	Swift & Company	C. Risley	G. Keeler
DEQ	Dairy R&D Corp.	G. Rey	G. Keeler
DPE	Corn Products Co.	C. Risley	G. Keeler

PPB 1206 Cont'd

FOOD & KINDRED PRODUCTS

12060	To	GPO	PM
DSB	U. of Oklahoma Res. Inst.	G. Putnicki	G. Keeler
DFF	Farmbest Inc.	O. Olson	G. Keeler
EAE	National Canners Assn.	W. Pierce	G. Keeler
EGV	Gold Kist Poultry	H. Snyder	G. Keeler
EIG	Western Potato Service	K. Dostal	G. Keeler
DXF	Crowley's Milk Co.	A. Richardson	G. Keeler
EDZ	Green Giant Co.	K. Dostal	G. Keeler
EKQ	Kent Cheese Co.	R. Burm	G. Keeler
EOF	Illinois Packing Co.	J. Witherow	G. Keeler
EUZ	Widmers Wine Cellars	R. Burm	G. Keeler
DXL	Nat. Canners-Ion Exchange	K. Dostal	G. Keeler
FDS	Beefland International	O. Olson	G. Keeler
FJK	Ebinger Baking Co.	C. Ris	G. Keeler
FLL	Am. Distilling Co.	R. Burm	G. Keeler
FQE	Nat. Canners Assn.	K. Dostal	G. Keeler
FMF	Iowa Beef Packers	O. Olson	G. Keeler

PPB 1206

FOOD & KINDRED PRODUCTS

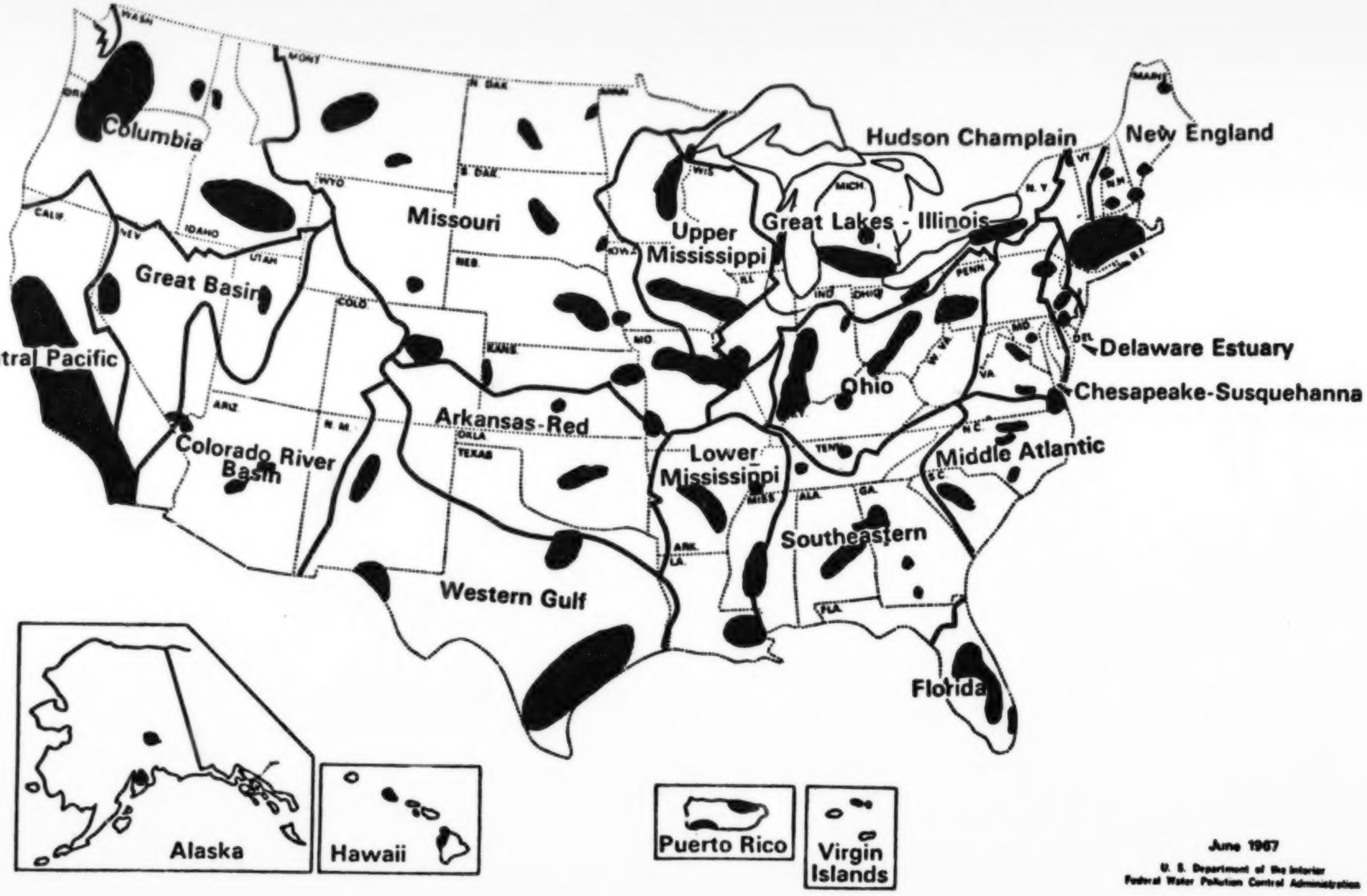
Harold G. Keeler
Program Manager

Activities under this subprogram element encompass those industries dealing with the processing of products for human or animal consumption. Major categories included hereunder are: (1) Meat products, (2) Dairies, (3) Canned and frozen foods, (4) Grain mills, (5) Bakery products, (6) Sugar, (7) Beverages, (8) Candy and related products and (9) Miscellaneous products (coffee, edible oils, etc.). Further breakdown is as depicted in the Standard Industrial Classification Manual.

Wastes generated by this industry, which is comprised of some 32,000 individual companies, represent 20 percent of the total pollutional load attributed to manufacturing. The mainly organic wastes exhibit extreme variations in BOD, suspended and dissolved solids, pH, etc., as well as in volume and duration of processing operations.

The program's objective is to assist the industry in the development of design, operational and economic data relating to new or improved systems for pollution abatement. In plant water conservation, pretreatment, chemical, physical and biological waste treatment, by-product recovery, and reuse of the final effluent to permit closed loop systems, will be investigated.

LOCATION OF MAJOR FOOD PROCESSING PLANTS
PPB 1206: Food & Kindred Products


Columbia
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Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Ohio
Middle Atlantic
Southeastern
Florida
Alaska
Hawaii
Puerto Rico
Virgin Islands

June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5 Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Washington
Professor Dale A. Carlson

TITLE OF PROJECT: Status and Research Needs for Potato Waste Waters

PROJECT SITE: Seattle, Washington

DATE AWARDED: June 1, 1968

FEDERAL GRANT: $18,364

TOTAL EST. PROJ. COST: $19,331

PROJECT NUMBER: WP-01486-01

PPBS NO. 1206

DESCRIPTION OF PROJECT: The objective of this project is to prepare an exhaustive state-of-the-art report on potato processing waste waters including identification of process and waste streams, effects of process modification, types of processes and corresponding waste water treatment processes, effects of waste streams on receiving waters and land areas, and recent research developments. The report will include a discussion of current major research needs.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Department of Food Science and Technology
Oregon State University
Corvallis, Oregon 97331

TITLE OF PROJECT: "Water Pollution Abatement in the United States Seafoods Industry: State of the Art"

EFFECTIVE DATE: June 30, 1969

PROJECT SITE: Corvallis, Oregon

DATE AWARDED: April 15, 1969

FEDERAL GRANT: $17,695

TOTAL EST. PROJ. COST: $18,652.00

PROJECT NUMBER: 12060 ECF

PPBS NO. 1206

DESCRIPTION OF PROJECT: The objective of this 8 months study will be the development of a State of the Art document on water pollution abatement technology and research for the seafoods processing industry.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: National Canners Association
1133-20th Street, N. W.
Washington, D.C. 20036

TITLE OF PROJECT: "Production and Disposal Practices for Liquid Wastes From Canning and Freezing Fruits and Vegetables"

PROJECT SITE: NCA, Berkeley, Calif.
U. of Wisconsin, Madison

DATE AWARDED: May 6, 1969

FEDERAL GRANT: $20,025

TOTAL EST. PROJ. COST: $22,542

PROJECT NUMBER: 12060 EDK

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this one year project will be the development of a state-of-art document to encompass: (1) current and projected contribution of this industry to the national water pollution problem; (2) description of present and anticipated waste treatment technology to include construction and operational data (3) identification of areas requiring further development.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

HGK 4/7/69

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 Research, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Ohio State University Research Foundation
1314 Kinnear Rd.
Columbus, Ohio 43212

PROJECT DIRECTOR: (Name and Address)
Dr. W. James Harper
215 Vivian Hall
2121 Fyffe Road
Columbus, Ohio 43210

TITLE OF PROJECT: "State of the Art of Dairy Plant Wastes and Waste-Treatment Systems"

PROJECT SITE: Columbus, Ohio

PROGRAM (PROJECT) NUMBER: 12060 EGU

DATE OFFERED: June 17, 1969

DATE ACCEPTED (AWARDED): June 27, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 6/30/70	$ 18,505	$ 12,954

DESCRIPTION OF PROJECT:

The objective of this one year project is the development of a State of the Art document for the dairy industry. Plant processing methods, water utilization, waste streams in various size and type of operations, dairy food plant waste treatment systems as a function of processing practice, plant size and location, current industrial development in dairy food processing and waste treatment, present research in progress and future research needs in relation to dairy wastes, will be covered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242 7-8

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation
156 South College Avenue
P. O. Box 538
Fort Collins, Colorado 80521

TITLE OF PROJECT: "State-of-Art, Sugarbeet Processing Waste Treatment"

PROJECT SITE: Fort Collins, Colorado **DATE AWARDED:** April 18, 1969

FEDERAL GRANT: $14,310 **TOTAL EST. PROJ. COST:** $15,900

PROJECT NUMBER: 12060 DSI **PPBS NO.** 1206

DESCRIPTION OF PROJECT:

The objective of this 8 month project will be the development of a state-of-art document encompassing current domestic and foreign waste treatment technology in the sugarbeet processing industry. The report will include recommendations on major research needs.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation
P.O. Box 538
Fort Collins, Colorado 80521

TITLE OF PROJECT: Anaerobic-Aerobic Sugar Beet Waste Treatment

PROJECT SITE: Tracy, California

DATE AWARDED: June 1, 1968

FEDERAL GRANT: $25,300 - 4th year

TOTAL EST. PROJ. COST: $243,450

PROJECT NUMBER: WPD 93-04-68

PPBS NO. 1206

DESCRIPTION OF PROJECT: The objective of this project is to demonstrate a solution to the pollution and odor problems encountered in beet sugar factory waste disposal. This will be accomplished by passing the wastes (mainly screened flume water) through system of anaerobic-facultative-aerobic lagoons set up in series. Some water from the aerobic lagoon will be recycled back to the surface of the anaerobic lagoon to eliminate odors.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. NW~~
Washington, D. C. 20242

RN 8/68

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Melbourne Water Science Institute
Water Science Laboratories
15-21 Earl Street
Carlton, Victoria, Australia

TITLE OF PROJECT: "Cannery Waste Treatment by Lagoons"

PROJECT SITE: Shepparton, Victoria Australia

DATE AWARDED: May 1, 1969

FEDERAL GRANT: $11,920

TOTAL EST. PROJ. COST: $61,810

PROJECT NUMBER: WPD 211-02-68
12060 EHS

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this study will be to demonstrate the feasibility of treating fruit and vegetable processing wastes by anaerobic lagoons and oxidation ditches.

The existing 100,000 gpd facilities at Shepparton will continue to be used during the final year of 2 year project to evaluate and optimize operational parameters of the anaerobic-aerobic system operating jointly or independently.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

HGK
3/69

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Agricultural Experiment Station
University of Puerto Rico
Rio Piedras, Puerto Rico

TITLE OF PROJECT: Disposal of Rum Distillery Wastes

PROJECT SITE: Rio Piedras, Puerto Rico **DATE AWARDED:** July 1, 1968

FEDERAL GRANT: $46,252 - 1st year **TOTAL EST. PROJ. COST:** $85,400

PROJECT NUMBER: WPD-226-01-68
12060 FDR **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objective of this project is to develop the best method for the disposal of rum distillery waste. The waste will be subjected to detailed analysis and then will undergo pilot treatment by means of anaerobic digestion, activated sludge, and lagooning. These processes will then be evaluated in terms of efficiency and economics.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

RN 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: RAI Research Corporation
36-40 37th Street
Long Island City, New York 11101

TITLE OF PROJECT: Improvement of Treatment of Food Industry Waste

PROJECT SITE: Long Island City, N.Y.

DATE AWARDED: Feb. 9, 1968

FEDERAL GRANT: $40,075/1 year

TOTAL EST. PROJ. COST: $57,250

PROJECT NUMBER: WPRD 3-01-68

PPBS NO. 1206

PROJECT OFFICER: Allyn Richardson NERO

DESCRIPTION OF PROJECT:

To investigate on a laboratory scale electrochemical oxidation of milk whey as a method of waste treatment.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

HGK 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: The R. T. French Company
Shelley, Idaho

TITLE OF PROJECT: "Aerobic Secondary Treatment of Potato Processing Wastes with Mechancial Aeration"

PROJECT SITE: Shelley, Idaho

DATE AWARDED: Aug. 1967

FEDERAL GRANT: $483,217

TOTAL EST. PROJ. COST: $690,310

PROJECT NUMBER: WPRD 15-01-R1-67
12060 EHV

PPBS NO. 1206

DESCRIPTION OF PROJECT: This project is designed to demonstrate the effectiveness of an aerobic secondary treatment plant for treating the total flow of potato processing wastes (1 MGD and 14,580 lb. BOD). The aerobic treatment will follow an existing primary treatment plant.

The secondary treatment plant will consist of three earthen aeration basins equipped with mechancial surface aerators, a mechancially cleaned secondary clarifier, an aerobic digester, and sludge disposal beds. In addition, a silt removal system will be constructed, consisting of screening facilities, a pumping station, and two earthen ponds to retain silt accumulations for one processing season.

The aeration system will be tested under three operating schemes: 1.) as an extended aeration system in which biological sludge is returned to the aeration basin and the excess, to the digester; 2.) as a flow-through aeration basin with sludge carryover into the effluent; and 3.) as an intermittent aeration system in which the clarified upper portion of the aeration basin contents is discharged directly to the river. During these operations, studies will be made on the effects of foaming ice, temperature, pH, and nutrients on the efficiency of the process.

STATUS: Contracts for long lead items such as the aeration equipment and clarifiers to be awarded within thirty days. Final design and specifications for construction of the treatment facility to be completed on or about May 1, 1968.

INQUIRIES: **Contact the** Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave., NW~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: FMC Corporation

TITLE OF PROJECT: "Cannery Waste Treatment by the Kehr Activated Sludge Process"

PROJECT SITE: Santa Clara, California

DATE AWARDED: December, 1966

FEDERAL GRANT: $29,300

TOTAL EST. PROJ. COST: $43,200

PROJECT NUMBER: WPRD 18-01-67
12060 EZP

PPBS NO. 1206

DESCRIPTION OF PROJECT: The Kehr Process, in essence, involves a combining of activated sludge aeration of 10,000 to 15,000 mg/l mixed liquor solids with aerobic digestion in a single aeration tank. This provides high removals of BOD, solids, and nutrients; facility for periodic high strength wastes; a stabilized, drainable water sludge; and comparatively low physical plant costs.

The objectives are to:

1. Demonstrate the revised Kehr Process using liquid-solids separation by high-rate flotation-densification system of activated sludge solids.

2. Demonstrate effectiveness of the process for treating cannery wastes combined with domestic sewage having a BOD_5 of 1000 to 2000 mg/l.

3. Demonstrate performance of the process with densified return sludge solids of 4% to 8% on a dry weight basis, thus affecting plant economy by use of smaller tankage volume.

4. Determine processing requirements for application to a full-scale treatment plant.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Minute Maid Company
Orlando, Florida

TITLE OF PROJECT: "Removal of Organics and Nutrients from Citrus Processing Plant Wastes"

PROJECT SITE: Leesburg and Auburndale
Florida

DATE AWARDED: December 1966

FEDERAL GRANT: $350,000

TOTAL EST. PROJ. COST: $550,000

PROJECT NUMBER: WPRD 38-01-67

PPBS NO. 1206

DESCRIPTION OF PROJECT:

In Florida, about 52 plants of the citrus industry discharge about 130 mgd of waste, having an organic concentration amounting to 318,000 lbs. of BOD daily, into streams and lakes of Florida. This project is a step towards solving this pollution problem.

The objective of this project is to demonstrate the design and operational factors for organic and nutrient removal of citrus process waste by the activated sludge process, by stabilization in oxidation ponds with and without induced aeration, and absorption of nutrients by plant life with subsequent drying of materials in citrus feed mill.

STATUS: Bids have been reviewed, selected, and contract awarded for construction of treatment facility at Auburndale. At Leesburg, the site is operational and worthwhile information being collected on mixed municipal and citrus processing wastes by the activated sludge system.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation

TITLE OF PROJECT: "Concentration of Sugar Beet Wastes for Economic Treatment with Biological Systems"

PROJECT SITE: Fort Collins, Colorado **DATE AWARDED:** December, 1966

FEDERAL GRANT: $102,000 **TOTAL EST. PROJ. COST:** $372,500

PROJECT NUMBER: WPRD 43-01-67
12060 FAK **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The project is one phase of research to find an economic chemical or biological system to treat high volumes of sugar beet factory waste. One or more successful processes are necessary to satisfy effluent standards in States where sugar beets are processed.

The objective of the project is to concentrate sugar-beet factory wastes by chemical precipitation and reuse of the decanted solution in a closed recirculation system. The excess water accumulated during the operation will be treated by anaerobic and/or aerobic processes to remove BOD prior to discharge. The bioactivity will be studied concurrently.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~.
Washington, D. C. 20242

8/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: North Star Research & Development Institute
3100 38th Avenue South
Minneapolis, Minnesota 55406

TITLE OF PROJECT: Use of Fungi Imperfecti in Waste Control

PROJECT SITE: Minneapolis, Minnesota

DATE AWARDED: Sept. 1, 1967

FEDERAL GRANT: $76,585

TOTAL EST. PROJ. COST: $118,585

PROJECT NUMBER: WPRD 49-01-68
12060 EHT

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this 2 year project is to evaluate rapidly growing fungi strains for use in biological waste treatment processes applicable to waste streams from soybean and corn processing operations.

Synthesized mycelium will be evaluated for use as animal and/or human dietary supplement.

Parameters for industrial scale-up to accomodate a 1-3 mgd process operation will be determined based on results from a 50 gpd pilot plant operating on a continuous culture and flow basis.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

HGK 8/68

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: John Morrell & Company
Ottumwa, Iowa 52501

TITLE OF PROJECT: "Construction and Study of a Demonstration Plant Utilizing the Aerobic Channel Method for Treating Packinghouse Wastes"

PROJECT SITE: Ottumwa, Iowa

DATE AWARDED: December 1966

FEDERAL GRANT: $489,000

TOTAL EST. PROJ. COST: $815,000

PROJECT NUMBER: WPRD-54-01-67
12060 EUB

PPBS NO. 1206

DESCRIPTION OF PROJECT: Four oxidation channels will be constructed to handle an equivalent load of 20,000 lbs. of BOD/day from a packinghouse on a 7-day basis with estimated flow of 3.5 mgd. The objective is to find an efficient, effective, and economical method of treating raw packinghouse wastes so they can be discharged directly into streams.

Each channel will be 460 ft. X 60 ft. with a capacity of 150,000 cu. ft. Channels 1&2 will receive raw wastewater from existing primary treatment systems. The overflow will be directed into Channels 3&4 which will be operated intermittently as aerator and settling basins. Channel 4 will allow the sludge to be returned to Channels 1&2 or removed for harvesting. The solids removed will be centrifuged or evaporated and dried.

The most feasible way of handling solids will be determined. Tests will be conducted to determine if the dried solids can be used an an animal-food supplement.

The process will be designed to give variable rates of aeration and flow to obtain maximum bio-chemical oxygen demand and nitrogen removal. The flow will be sampled and analyzed for total nitrogen, chemical oxygen demand, suspended solids, total solids, and grease; weekly samples will be tested for total volatile solids, total fixed solids, phosphate, total bacterial content, and coliform count.

STATUS: Final design and specifications for the treatment facility have been completed. Expect to advertise for bids no latter than April 15,1968 and begin construction during May 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave., N.W.*~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Vahlsing, Inc.
Easton, Maine

TITLE OF PROJECT: "Treatment of Alkaline Wastes from Potato Processing"

PROJECT SITE: Easton, Maine

DATE AWARDED: December 1966

FEDERAL GRANT: $196,014

TOTAL EST. PROJ. COST: $280,020

PROJECT NUMBER: WPRD 56-01-67
12060 FAG

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objectives of this project are to demonstrate the feasibility of; treating potato processing waste using the activated sludge system ; combining potato processing waste with sugar beet refining waste; and the feasibility of three in-plant closed waste water systems in the sugar beet plant.

The project will provide extremely valuable data to both the potato processing and beet sugar industry. The aim is also to determine if a $30 million industrial complex, composed of potato and sugar beet processing and a residential community, can exist on a small stream, as is proposed, and have clean water.

STATUS: Expect to receive final design and specifications for construction of the 600 gpm pilot scale activated sludge system, and proceed with advertisement thereof April 1, 1968, construction to begin shortly after May 1, 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. NW~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Snokist Growers (formerly Blue Ribbon-Big Y Growers)
Yakima, Washington

TITLE OF PROJECT: "Pollution Prevention by Aeration of Fruit Processing Wastes."

PROJECT SITE: Yakima, Washington — **DATE AWARDED:** August 1967

FEDERAL GRANT: $347,669 — **TOTAL EST. PROJ. COST:** $572,262

PROJECT NUMBER: WPRD 58-01-68
12060 FAD — **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The cannery now discharges it fruit-processing wastes into the Yakima River. The objective of this project is to determine the most economical method of removing 90% of the BOD from an expected flow of 2.6 MGD with a BOD_5 loading of 20,000 lbs.

Aeration methods, including modifications to the activated sludge process, will be tested on a plant-size scale to determine their effectiveness in treating fruit processing wastes.

Existing and specially designed new facilities, including lagoons and clarifiers, will be used in prototype studies of the effects of varying amounts of aeration, waste loading, waste detention, sludge returns, and chemical on the BOD level.

During the 1967 canning season, the lagoon and clarifier will be operated as a completely mixed activated-sludge facility. The new lagoon, with added aerators will operated as an aeration lagoon with no sludge return, each under varied loadings. During the 1968 canning season the facilities will be operated as a modified contact stabilization facility.

Information on the modifications will be compared and the results will be applied to the activated sludge process for use by industry and government as method for the biological treatment offruit processing wastes.

STATUS: Aeration basin completed and operational. Contracts being awarded for balance of construction. Facility to be completely operational by September 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: National Canners Association Research Foundation
1133 20th Street, N. W.
Washington, D. C. 20036

TITLE OF PROJECT: "Reconditioning and Reuse of Food Processing Brines"

PROJECT SITE: Central Valley, Calif. **DATE AWARDED:** February 1, 1968

FEDERAL GRANT: $31,500 **TOTAL EST. PROJ. COST:** $45,000

PROJECT NUMBER: WPRD-134-01-68 **PPBS NO.** 1206
12060 EHU

DESCRIPTION OF PROJECT: Briefly the proposal is to conduct a pilot scale study to determine the feasibility of re-using spent brines from storage and processing operations in olive packing by reconditioning the brine through a charcoal absorption and filtration column. The portable filter will be operated throughout the duration of the two year project at each of four locations in the California Central Valley area.

The supporting collection, reduction and analysis of data will be directed toward eliminating the present tie-in to municipal sewage system as well as lagoon systems used by olive processors and develop economic and effectiveness data for full scale development.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: National Canners Association
1133 20th Street, N.W.
Washington, D.C. 20036

TITLE OF PROJECT: "Integrated Treatment of Liquid Wastes from Food Canning Operations"

PROJECT SITE: San Jose, California **DATE AWARDED:** 2/14/68

FEDERAL GRANT: $33,330 **TOTAL EST. PROJ. COST:** $55,120

PROJECT NUMBER: WPRD 151-01-68 **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objectives of this proposal are as follows: (1) to determine the feasibility of employing a high rate trickling filter in the San Jose, California canning plant to treat strong organic wastes encountered in vegetable and fruit processing operations, which although low in volume (approx. 20% of total), contribute as much as 60% to the total BOD load. The filter will be 14 ft. in diameter and 21.5 ft. high, employing synthetic media and operating in a range between 100 and 200 gpm. It will be subjected to variations in flow, pH control and nutrient addition to determine its optimun working parameters. (2) To determine the effectiveness of using an air flotation process with and without addition of flocculants in removing suspended solids prior to secondary treatment. (3) To evaluate center discharge solids separation techniques and its effect on the total BOD content.

A study will also be made of the usage of edible acids as a bacteriostatic agent to prevent growth in recirculated flume water. Following the one year testing operation, it is proposed to select units to be incorporated in full scale plant operations for a further demonstration project. The reason for the low project cost is due to NCA already having on hand several pieces of equipment required to test these processes.

STATUS: Received worthwhile information on operation of units during last fall's processing operations. Will continue with evaluation of the various units this fall.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Winter Garden Citrus Products Cooperative
P. O. Box 399
Winter Garden, Florida

TITLE OF PROJECT: "Lime Treatment and Inplant Reuse of an Activated Sludge Plant Effluent in the Citrus Processing Industry

PROJECT SITE: Winter Garden, Florida **DATE AWARDED:** March 22, 1968

FEDERAL GRANT: $165,000 **TOTAL EST. PROJ. COST:** $397,300

PROJECT NUMBER: WPRD-161-DI-(R-2)-68 **PPBS NO.** 1206
12060 EZY

DESCRIPTION OF PROJECT: The objective of this proposal will be to develop operational parameters and conduct an economic evaluation on lime treatment of effluent from a 2 mgd. activated sludge system treating citrus wastes and in-plant reuse of the lime treatment effluent. This study will cover lime treatment, with the addition of coagulant aids, and dewatering of sludges by centrifugation for usage in cattle feed preparation. Determination will be made on this system's effective in further reducing BOD, COD, and nutrients found in the activated sludge effluent.

The proposed project intends to demonstrate the effectiveness of lime precipitation on effluent from a 2 mgd. activated sludge system treating citrus wastes. The activated sludge system consists of an aeration pond providing from 24 to 36 hours detention time with the overflow being directed into a final clarifier. Operation of the activated sludge system will afford pH control along with nutrient supplementation and sludge recirculation.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~.
Washington, D. C. 20242

4/68

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Swift and Company
R&D Center
1919 Swift Drive
Oak Brook, Illinois 60521

TITLE OF PROJECT: "Removal and Recovery of Fatty Materials from Edible Fat and Oil Refinery Effluents"

PROJECT SITE: Bradley, Illinois **DATE AWARDED:** JUL 1 0 1968

FEDERAL GRANT: $249,307 **TOTAL EST. PROJ. COST:** $389,970

PROJECT NUMBER: WPRD-185-01-(R-1)-68 **PPBS NO.** 1206
12060 DQV

DESCRIPTION OF PROJECT:

The 18 month study to be conducted at the Swift and Company Bradley Refinery plant will have as its main objectives to demonstrate the effectiveness and economics of employing air flotation for the removal and recovery of fatty material present in water eminating from processing operations.

In addition to an extensive study of flocculating agents, a complete characterization of processing waste streams is planned. Laboratory analysis will include BOD, COD, ether solubles and suspended solids determinations, etc.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242
7-25

HGK:5/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________; under Section 6(b)
Federal Water Pollution Control Act (Clean Water Restoration Act).

Grant Director: Mr. Sidney Boxer, Dairy Research & Development Corporation

GRANTEE OR CONTRACTOR:
(Name and Address)

Dairy Research and Development Corporation
111 Broadway
New York, N. Y. 10006
Phone: 212-227-2726

PROJECT DIRECTOR:
(Name and Address)

Mr. Edred W. Bowen
Dairymens League
1250 Broadway
New York City, N.Y.

TITLE OF PROJECT: "Elimination of Pollution by and Utilization of Protein Concentrates (Dried Whey) from Milk Residues of Cheese Making"

PROJECT SITE: Vernon, New York

PROGRAM (PROJECT) NUMBER: 12060 DEQ
WPRD 219-01-R1

DATE OFFERED: November 7, 1968

DATE ACCEPTED (AWARDED): December 19, 1968

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/19/68 Thru: 12/19/70	$2,499,038	$551,350

DESCRIPTION OF PROJECT: A development and full scale demonstration for a process for the conversion of dairy whey into saleable food products by evaporation and spray drying methods. The conversion of whey to a useable food product in lieu of its disposal as a waste product from cheese manufacturing is the pollution abatement method to be developed and demonstrated. Research will be conducted on the use of dried whey as a supplement to various food products.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Corn Products Company
Corporate Engineering
P.O. Box 345
Argo, Illinois 60501

TITLE OF PROJECT: "Treatment of Wastes from the Wet-Milling Industry"

PROJECT SITE: Pekin, Illinois **DATE AWARDED:** July 24, 1968

FEDERAL GRANT: $482,680 **TOTAL EST. PROJ. COST:** $2,656,400

PROJECT NUMBER: WPRD-221-01-(R-1)-68 **PPBS NO.** 1206
12060 DPE

DESCRIPTION OF PROJECT: The 3½ year project entails the design, construction, operation, and an economic and technical evaluation of a 1 mgd completely mixed aerobic system for treatment of corn refining wastes.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: University of Oklahoma Research Institute
1808 Newton Drive
Norman, Oklahoma 73069

TITLE OF PROJECT: "Demonstration of a Full Scale Waste Treatment System for a Cannery"

PROJECT SITE: Stilwell, Oklahoma

DATE AWARDED: JUL 25 1968

FEDERAL GRANT: $75,226

TOTAL EST. PROJ. COST: $117,807

PROJECT NUMBER: WPRD-230-01-(R-1) 68
12060 DSB

PPBS NO. 1206

DESCRIPTION OF PROJECT: The objectives of this 18 month study will be to conduct an economic and technical evaluation of a 1.5 mgd biological system employing a combination of both the minimal solids and extended aeration techniques to treat high strength, nutritionally unbalanced cannery wastes.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Farmbest, Inc.
Denison, Iowa

TITLE OF PROJECT: Waste Treatment Facility, Farmbest, Inc., Denison, Iowa

PROJECT SITE: Denison, Iowa

DATE AWARDED: October 5, 1968

FEDERAL GRANT: $289,790

TOTAL EST. PROJ. COST: $755,587

PROJECT NUMBER: WPRD 241-01-68
12060 DFF

PPBS NO. 1206

DESCRIPTION OF PROJECT:

This is a 15 month project to demonstrate, over one full year of operation, the application of anaerobic lagoons and two-stage trickling filters for the treatment of strong wastes resulting from the slaughtering and processing of hogs. This plant kills about 5000 hogs daily and waste flows average about 0.85 mgd. Data will be collected on the strength of wastes and the efficiency of individual treatment units under various loadings and weather conditions so the results can be projected for new plants using any combinations of these treatment units.

INQUIRIES: Contact the

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
National Canners Association, Research Foundation
1133 20th Street, N.W.
Washington, D. C. 20036

PROJECT DIRECTOR: (Name and Address)
Mr. Walter Mercer, NCA Western Research Laboratory
1950 Sixth Street
Berkeley, California 94710

TITLE OF PROJECT: "Evaluation of Controlled Temperature and Forced Aeration in Trickling Filter Treatment of Food Canning Waste Waters"

PROJECT SITE: San Jose, California

PROGRAM (PROJECT) NUMBER: 12060 EAE

DATE OFFERED: May 15, 1969

DATE ACCEPTED (AWARDED): June 10, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: May 15, 1969 Thru: Nov. 15, 1969	$ 28,712	$ 18,350

DESCRIPTION OF PROJECT: The objectives of this project to be conducted at the DelMonte Corporation Plant No. 3 at San Jose, California are as follows:

1. To evaluate the performance and BOD reduction capacity on high strength liquid canning wastes of a 10,000 gpd trickling filter unit containing such special features as forced aeration and temperature control of the treatment column preceeded by grinding and screening components.
2. To compare the efficiency of this unit with that of the trickling filter without temperature control and forced aeration operated under WPRD 151-01-68, by subjecting them both to identical loadings eminating from the same waste source.
3. To incorporate the results of this evaluation into the design of a full scale demonstration project to be implemented in 1970. The six month project is an extension of work initiated under WPRD 251-01-68.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Gold Kist Poultry Division
Cotton Producers Association
P. O. Box 2210
Atlanta, Georgia 30301

PROJECT DIRECTOR: (Name and Address)
Byron Hawkins
Gold Kist Poultry
910 Latta Street
Durham, N.C. 27704

TITLE OF PROJECT: "Water and Waste Management in Poultry Processing"

PROJECT SITE:
Gold Kist Poultry
910 Latta Street
Durham, N.C.

PROGRAM (PROJECT) NUMBER: 12060 EGV

DATE OFFERED: June 12, 1969

DATE ACCEPTED (AWARDED): June 26, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 6/30/71	$ 283,381	$198,366

DESCRIPTION OF PROJECT:

The University of North Carolina will conduct a two year study which involves changes in the Gold Kist processing operations for demonstration of effective in-plant control of both water use and discharge of effluent from poultry processing. The project encompasses water use and waste abatement throughout the plant, from water intake through final waste-water collection and control.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Western Potato Service, Inc.
P. O. Box 1391 Highway #2 West
Grand Forks, North Dakota 58201

PROJECT DIRECTOR: (Name and Address)
James L. Martin
Potato Service, Inc.
P. O. Box 809
Presque Isle, Maine 04769

TITLE OF PROJECT: "Full Scale Demonstration and Evaluation of Potato Dry and Wet Caustic Peeling Processes"

PROJECT SITE:
Presque Isle Maine (Wet)
Grand Forks, North Dakota (Dry)

PROGRAM (PROJECT) NUMBER: 12060 EIG

DATE OFFERED: July 1, 1969

DATE ACCEPTED (AWARDED): July 22, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 1/1/71	$1,042,212	$396,574

DESCRIPTION OF PROJECT:

The objective of this grant will be to demonstrate at full scale the economics and pollution reduction characteristics of a potato "dry" caustic peeling system and use as a base for comparison data to be obtained from a similar facility employing the conventional "wet" caustic peeling operation.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Crowley's Milk Company, Inc.
145 Conklin Avenue
Binghamton, N.Y. 13902

PROJECT DIRECTOR: (Name and Address)
Dr. Robert R. Zall
Director of Research & Production
Crowley's Milk Company, Inc.
145 Conklin Avenue
Binghamton, N. Y. 13902

TITLE OF PROJECT: "Development and Demonstration of an Ultrafiltration Plant for the Abatement of Pollution from Cottage Cheese Whey"

PROJECT SITE: Ph. 1 Binghamton, New York

PROGRAM (PROJECT) NUMBER: 12060 DXF

DATE OFFERED: August 8, 1969

DATE ACCEPTED (AWARDED): Sept. 3, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 1/1/72	$914,081	$495,856

DESCRIPTION OF PROJECT:

A two stage Ultrafiltration system for the separation and concentration of protein and lactose or straight acid whey concentration with a resulting influent BOD reduction of 99% will be demonstrated. The first phase, lasting 13 months, calls for the design, detailed engineering, construction, operation and evaluation in Binghamton, N. Y. of a 10,000 lb/day UF system and will include the design of a 250,000 lb/day system for full scale demonstration under phase II. Duration of phase II will be 17 months.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 6B, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: Green Giant Company
(Name and Address) LeSueur, Minnesota 56058

PROJECT DIRECTOR: Dr. E. E. Erickson
(Name and Address) North Star Research & Development Inst.
3100 38th Avenue
Minneapolis, Minnesota 55406

TITLE OF PROJECT: Pilot Plant Installation for Use of Fungi Imperfecti on Vegetable Wastes

PROJECT SITE: North Star Research & Development Institute
Minneapolis, Minnesota

PROGRAM (PROJECT) NUMBER: 12060 EDZ

DATE OFFERED: September 1, 1969

DATE ACCEPTED (AWARDED): Sept. 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 12/31/70	$72,860	$49,742

DESCRIPTION OF PROJECT: To demonstrate and evaluate on a pilot scale basis the use of fungi imperfecti as a biological agent in a aerated treatment system which treats high BOD vegetable processing wastes. According to bench scale tests the fungi are capable of removing organic nutrients with a related BOD reduction in excess of 98% with a 20 hour residence time. An aerated lagoon and aerated ditch will be employed to evaluate the fungi as a system component and the related operational and system characteristics will be defined.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This project is a Demonstration grant under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR:
(name and address)
Kent Cheese Company
1931 North 15th Avenue
Melrose Park, Illinois 60160

PROJECT DIRECTOR:
(name and address)
Allen E. Fehr
626 West South Street
Freeport, Illinois 61032

TITLE OF PROJECT: "Kent Cheese Company - Waste Treatment Facility"

PROJECT SITE: Kent, Illinois

PROGRAM (PROJECT) NUMBER: 12060 EKQ

OFFERED: September 11, 1969

DATE ACCEPTED (AWARDED): Sept. 26, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 11/1/70	$65,722.80	$46,006.00

DESCRIPTION OF PROJECT:

Demonstrate the effectiveness of aerated lagoons for the treatment of cheese whey process rinse water and permeate from a whey reverse osmosis unit. The treatment system will utilize two aerobic lagoons inseries with submerged mechanical aeration equipment producing an extended aeration process. Data will be collected to allow evaluation of the extented aeration process to cheese whey waste flows.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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[illegible]

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration, under Section 6B, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Illinois Packing Company
911 West 37th Place
Chicago, Illinois 60609

PROJECT DIRECTOR: (Name and Address)
Roy J. Ricci, Procedyne Corp.; 221 Somerset St.
New Brunswick, N.J. 08903

TITLE OF PROJECT: A Method of Manure Disposal for a Beef Packing Operation

PROJECT SITE: Illinois Packing Co.

PROGRAM (PROJECT) NUMBER: 12060 EOF

DATE OFFERED: Sept. 24, 1969

DATE ACCEPTED (AWARDED): Oct. 22, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/22/69 Thru: 6/21/71	$ 156,000	$ 93,400

DESCRIPTION OF PROJECT:

A twenty month project to demonstrate the feasibility of the incineration of cattle paunch and ground manure. The project objectives will include the following:

To segregate existing process waste streams for concentration of waste solids.
To develop physical parameters for process waste streams.
To design and construct a fluidized bed incineration unit.
To investigate and document the treatment system performance, the economics, optimal operating characteristics and the significance of the system in terms of application to other segments of the animal production industry.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: Widmer's Wine Cellars, Inc.
(Name and Address) Naples, New York 14512

PROJECT DIRECTOR: Edwin Haynes
(Name and Address) Widmer's Wine Cellars, Inc.
Naples, New York 14512

TITLE OF PROJECT: Winery Wastewater-Characterization and Treatment

PROJECT SITE: Naples, New York

PROGRAM (PROJECT) NUMBER: 12060 EUZ

DATE OFFERED: November 20, 1969

DATE ACCEPTED (AWARDED): Dec. 18, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/18/69 26 months Thru: 2/17/72	$284,000	$148,900

DESCRIPTION OF PROJECT:

This project includes design, construction and operation of an extended aeration waste treatment plant to treat the process wastewaters from a winery.

The activities of the project are to characterize the winery wasteflow; design, construct and operate an extended aeration waste treatment system; study and document the treatment system, optimize the system; and determine the effectiveness of nutrient addition to the operation of the system.

The facility will be designed for a 120,000 gpd flow.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
National Canners Association
Research Foundation
1133 20th Street
Washington, D.C. 20036

PROJECT DIRECTOR: (Name and Address)
Jack W. Ralls
National Canners Association
1950 Sixth Street
Berkeley, California 94710

TITLE OF PROJECT: Reduction of Salt Content of Food Processing Liquid Waste Effluent

PROJECT SITE: Berkeley, California

PROGRAM (PROJECT) NUMBER: 12060 DXL

DATE OFFERED: November 24, 1969

DATE ACCEPTED (AWARDED): Dec. 8, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/8/69 12 month Thru: 12/7/70	$94,208	$ 64,382

DESCRIPTION OF PROJECT:

The project will demonstrate the effectiveness of an ion exchange system for the treatment of olive brine waste water. The 10,000 gpd pilot unit will use calcium hydroxide as a resin regenerant and will be operated jointly by the National Canners Association and Aqua Ion Corporation. The operating parameters of the system will be established and scale up factors determined. It is anticipated that the degree of treatment will encourage the olive industry to consider water reuse and product recovery when full scale installations are considered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Beefland International, Inc.
Council Bluffs, Iowa 51501

PROJECT DIRECTOR: (Name and Address)
Ray Burke, Vice President
Beefland International, Inc.
Council Bluffs, Iowa 51501
(712) 328-3941

TITLE OF PROJECT: "Elimination of Water Pollution by Packing House Animal Paunch and Blood"

PROJECT SITE: Council Bluffs, Iowa

PROGRAM (PROJECT) NUMBER: 12060 FDS

DATE OFFERED: Nov. 25, 1969

DATE ACCEPTED (AWARDED): Dec. 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Nov. 10, 69 Thru: May 10, 71	$ 367,870	$ 161,398

DESCRIPTION OF PROJECT:

This 18 month project will demonstrate the economic and technical feasibility of completely segregating blood and paunch from slaughterhouse operations and converting these materials into animal feed ingredients. Two dehydrators will be installed at Beefland International, Inc. and utilized to process the material generated from anticipated cattle kills of 250 head per hour.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Food and Kindred Products

TITLE of PROJECT: Acid Emulsion Breaking-Activated Sludge for Bakery Waste

GRANTEE or CONTRACTOR
: Ebinger Baking Co.
2290 Bedford Ave.
Brooklyn, New York 11226

PROGRAM NUMBER
: 12060 FJK

TOTAL ESTIMATED COST
: $464,860

GRANT or CONTRACT AMOUNT
$ 129,729

PROJECT DIRECTOR
: Leon Beltzer
Ebinger Baking Co.
2290 Bedford Ave.
Brooklyn, New York 11226

PROJECT SITE
: Melville, New York

PROJECT PERIOD
Months : 22 months
From : June 9, 1970
To : April 30, 1972

DESCRIPTION of PROJECT:

A waste treatment system will be designed, constructed, operated and evaluated for a 80,000 gallon per day effluent from a sweet-goods bakery. Acid emulsion breaking will be used as a pretreatment step to destabilize the fats and oils in the waste, activated sludge will be used as the secondary treatment process and a multimedia filtration system will be used to render the effluent suitable for subsurface leeching.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 4 /70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products
TITLE of PROJECT : Activated Sludge - Bio Disc Treatment of Distillery Wastes

PROJECT SITE :

GRANTEE or CONTRACTOR
: American Distilling Co.
So. Front Street
Pekin, Illinois 61554

PROJECT DIRECTOR
: Robert G. Paulette
Stanley Consultants
Muscatine, Iowa 52761

PROGRAM NUMBER
: 12060 FLL

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: 1,078,000

PROJECT PERIOD
Months : 24
From : June 22, 1970
To : June 22, 1972

GRANT or CONTRACT AMOUNT
$ 384,588 *or* 38.25 *%*
of eligible project costs.

DESCRIPTION of PROJECT :

The objectives of this project are to evaluate on a plant scale basis, the performance of Bio Disc and activated sludge processes for treating distillery waste water. Investigations will involve comparative operating and capital costs of the two treatment processes, evaluation of treatment efficiency and the development of design parameters for industry wide waste treatment process selection and sizing.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDV[✓ K]R 4 / 70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products
TITLE of PROJECT : Dry Caustic Peeling of Tree Fruit to Reduce Liquid Waste Volume and Strength
PROJECT SITE : Berkeley, California

GRANTEE or CONTRACTOR
: National Canners Association
1950 Sixth Street
Berkeley, California 94710

PROJECT DIRECTOR
: Jack W. Ralls
Research Manager, NCA
1950 Sixth Street
Berkeley, California 94710

PROGRAM NUMBER
: 12060 FQE

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: $19,539

GRANT or CONTRACT AMOUNT
$17,538 *or* 90% *%*
of eligible project costs.

PROJECT PERIOD
Months : 9 months
From : March 30, 1970
To : December 31, 1970

DESCRIPTION of PROJECT :

The National Canners Association in cooperation with the U.S. Department of Agriculture will install demonstration scale equipment in a fruit cannery. The basic project objectives are to demonstrate the feasibility of using the dry caustic peeling process in the processing of tree fruit. Operational data will be collected during the grant period which will allow the comparison of the yield and quality of the peeled fruit and the quantity and quality of the process wastes with the conventional peeling process.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWQR 3/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Demonstration Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : 1206
TITLE of PROJECT : "Evaluation of the Rotating Biological Surface System on Meat Packing Wastes"
PROJECT SITE : Dakota,City, Nebraska

GRANTEE or CONTRACTOR
: Iowa Beef Packers, Inc.
Dakota City, Nebraska 68731

PROJECT DIRECTOR
: Jimmie A. Chittenden
Iowa Beef Packers, Inc.
Dakota City, Nebraska 68731

PROGRAM NUMBER
: 1206

GRANT or CONTRACT NUMBER
: 12060 FMF

TOTAL ESTIMATED COST
: $559,230

PROJECT PERIOD
Months : 24 months
From : 15 May 1970
To : 15 May 1972

GRANT or CONTRACT AMOUNT
$195,751 *or* 42 %
of eligible project costs.

DESCRIPTION of PROJECT :

The two year project consists of building and evaluating a 3MGD anaerobic-aerobic system where the aerobic treatment will be achieved by the use of eight two stage rotating biological surface units with a total surface area of 500,000 sq. ft.

Design, operational and economic data, including the existing pretreatment operations, will be documented.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 6/70

PPB 1207

MACHINERY & TRANSPORTATION EQUIPMENT

12070	To	GPO	PM
117	Johns Hopkins Univ. Renn	H. Snyder	E. Dulaney

PPB 1207

MACHINERY AND TRANSPORTATION EQUIPMENT

E. L. Dulaney, P.E.

Industrial activities in the Standard Industrial Classification Groups 34 (Fabricated Metal Products), 35 (Machinery), 36 (Electrical Machinery), and 37 (Transportation Equipment) are included in this subprogram element. Combined water usage is approximately 3.7 billion gallons per day or 4.4% of industrial water use. Approximately 0.38 billion gallons per day is used in processing and operations. Oil, particulate matter, and cleaners constitute the principal contaminants in waste waters. The physical processes of sedimentation and flotation are the most frequently employed treatment methods but most of the installations provide no waste treatment facilities. The need for application of existing technology is the primary waste treatment need in these industries.

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: The Johns-Hopkins University, Dr. Charles E. Renn
Department of Environmental Engineering Science
Baltimore, Maryland 21218

TITLE OF PROJECT: Management of Recycled Waste-Process Water Ponds

PROJECT SITE: Hampstead, Maryland

DATE AWARDED: December 1, 1967

FEDERAL GRANT: $39,627.00

TOTAL EST. PROJ. COST: $180,921

PROJECT NUMBER: WPD 117-03

PPBS NO. 1207

DESCRIPTION OF PROJECT:

Grant Period: 12 months

The purpose of this project is to develop detailed information on the operational techniques required to permit the utilization of a limited supply of treated domestic wastewaters for a variety of manufacturing processes. Requirements for control of biological processes in wastewaters impounded and recycled extensively within manufacturing processes and operations is being investigated.

The project is being conducted at the Black and Decker Manufacturing Companys' Hampstead, Md. plant.Operations in the plant involve stamping, pressing, punching, grinding, forging, assembly, and performance testing in a controlled environment requiring 2600 tons of refrigeration for air conditioning during the warm months. The water supply from wells is very limited. Domestic wastewaters are treated and routed to a nine acre impoundment for recirculation through the plant processes and operations. A "no-additional-cost" time extension has been requested to permit further evaluation through another summer season.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

ELD 3/69

PPB 1208

STONE, CLAY & GLASS PRODUCTS

12080	To	GPO	PM
EZF	Johns-Manville Products Corp.	R. Christensen	C. Ris

PPB 1208

STONE, CLAY & GLASS PRODUCTS

Arthur H. Mallon, P.E.

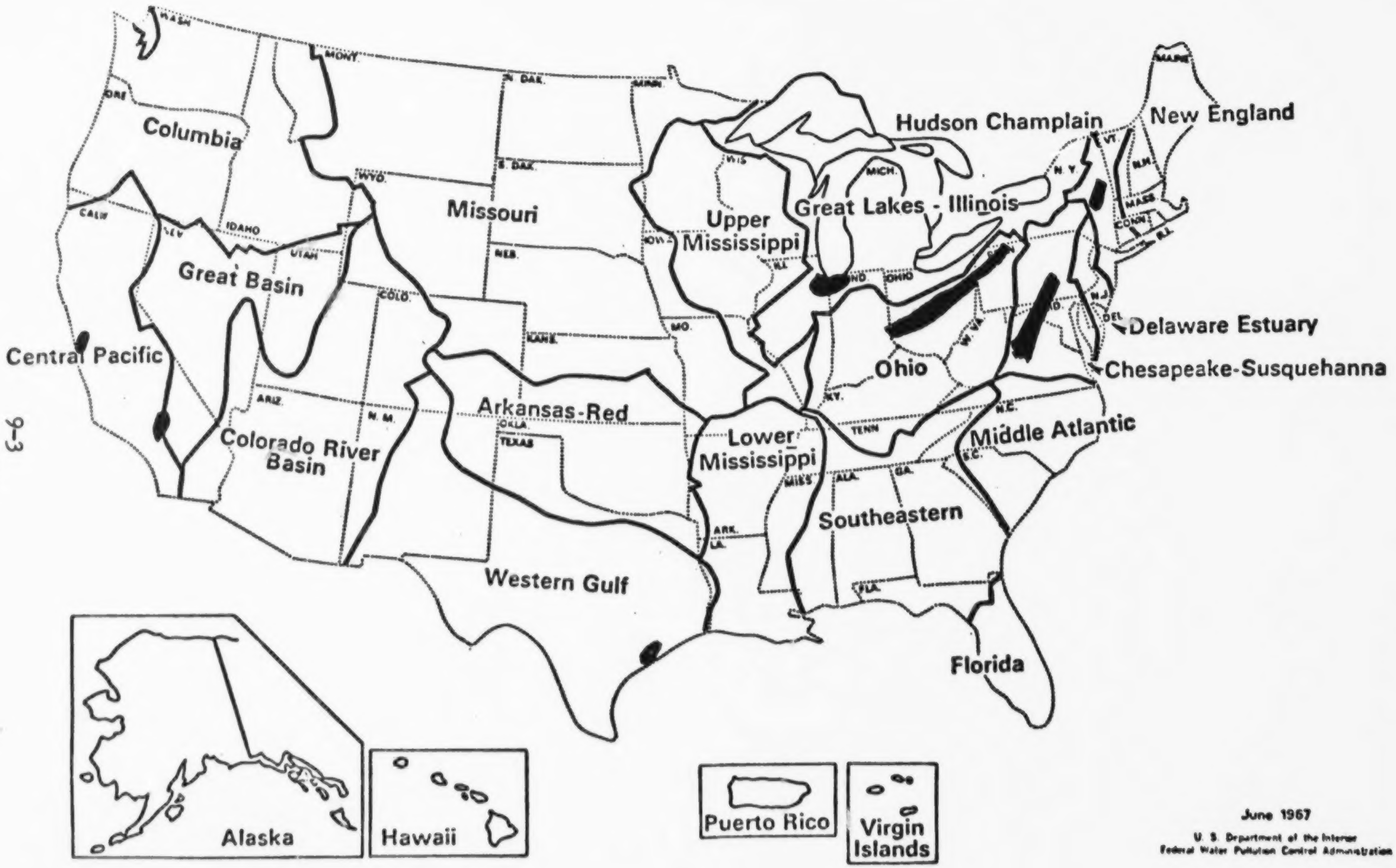
Industrial wastes from the processing and manufacturing of flat glass and pressed and blown glassware, pottery and similar products, as well as structural clay products are included in this sub-program element together with cement, concrete, and plaster products. Ready-mix and precasting operations as well as those activities involved with lime and gypsum products are also included. In addition, non-metallic mineral items such as asbestos and abrasive products are included.

The objective is to determine quality and quantity of wastes from these sources and the present treatment practices, if any, to permit the implementation of new feasible treatment methods with an eye towards reduced treatment costs, reduced water use, renovation and reuse of water, and by-product recovery.

The waste from these processes are composed in part of fine suspensions and sediments of the various non-metallic minerals of the raw material, or the expended material used in the various manufacturing operations.

The wastes are varied and voluminous. The separation, transportation and disposal or reprocessing of these wastes constitute a significant part of the effort to alleviate the water pollution resulting from processing of the various materials in this category.

LOCATION OF HYDRAULIC CEMENT INDUSTRY
PPB 1208: Stone, Clay, Glas Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Ohio
Middle Atlantic
Southeastern
Florida
Alaska
Hawaii
Puerto Rico
Virgin Islands
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June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Johns-Manville Products Corporation
Manville, New Jersey

TITLE OF PROJECT: "Experimental Closed Water System to Eliminate Waste Water Discharge from Johns-Manville Plant No. 3.

PROJECT SITE: Defiance, Ohio

DATE AWARDED: September 1, 1967

FEDERAL GRANT: $82,350

TOTAL EST. PROJ. COST: $164,700

PROJECT NUMBER: WPRD 87-01-67
12080 EZF

PPBS NO. 1208

DESCRIPTION OF PROJECT:

This project is designed to demonstrate the effectiveness of a total process-water reuse system involving diatomite filtration to treat wastes from the production of glass fiber insulations and elements.

The objective of this project is to eliminate completely the discharge of phenolic waste water from the Johns-Manville Plant. The plant now discharges 30 to 50 gpm of waste water which eventually flows into the Maumee River. This river has been cited as one of the critically polluted rivers of the nation.

The waste water now contains glass fiber, caustic, and phenols. As a part of the project, all of the process waste water will be recirculated. The residual solids, consisting of glass fibers and phenolic binders, will be removed by screening and diatomite filtration. Caustic cleaning solutions will be segregated from the manufacturing process water, ponded, and treated as required for dumping or for return to plant process use.

PROGRESS TO MARCH 25, 1968: Approval to purchase certain long-lead items of equipment on low bids has been given with repayment subject to approval of the final plans and specifications. The final plans and specifications are complete except for the electrical wiring and should be submitted for approval within two weeks.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

ELD:3/68

PPB 1209

TEXTILE MILL PRODUCTS

12090	To	GPO	PM
ECU	N. Carolina State U.	H. Snyder	C. Ris
ECS	Clemson U. - Porter	D. Hill	C. Ris
EOX	Clemson U. - Porter	W. Garrison	C. Ris
EOE	N. Carolina State U.	H. Snyder	C. Ris
EUX	Fiber Industries	R. Thacker	C. Ris
ESG	American Enka Corp.	E. Lomasney	C. Ris
DWM	C. H. Masland & Sons	D. Smith	C. Ris
EQO	Palisades Industries	D. Smith	C. Ris
EGW	Holliston Mills	E. Lomasney	C. Ris
FWD	Am. Assn. Textile C. & Ch.	D. Hill	C. Ris

PPB 1209

TEXTILE MILL PRODUCTS

Charles H. Ris, P.E.

Program Manager

Program Objectives

The R&D program for the textile industry receives support under the FWQA grant and contract monies from Section 5 and Section 6 of the Clean Water Restoration Act of 1966. The objectives of the program are as follows:

(1) To define the water pollution problem as it pertains to the textile industry.

(2) To research, develop and demonstrate the required technology to achieve at minimum cost the equivalent of 85% & 95% removal of contaminants and the technology to achieve water reuse.

The objectives are met through the awarding of grants and contracts to universities, industries and municipalities and through in-house research activities carried out by the Southeast Water Laboratory.

The waste water flows may be identified with the following textile fibers and processing operations:

Cotton: Sizing, desizing, scouring, bleaching, mercerizing, dyeing, printing, finishing

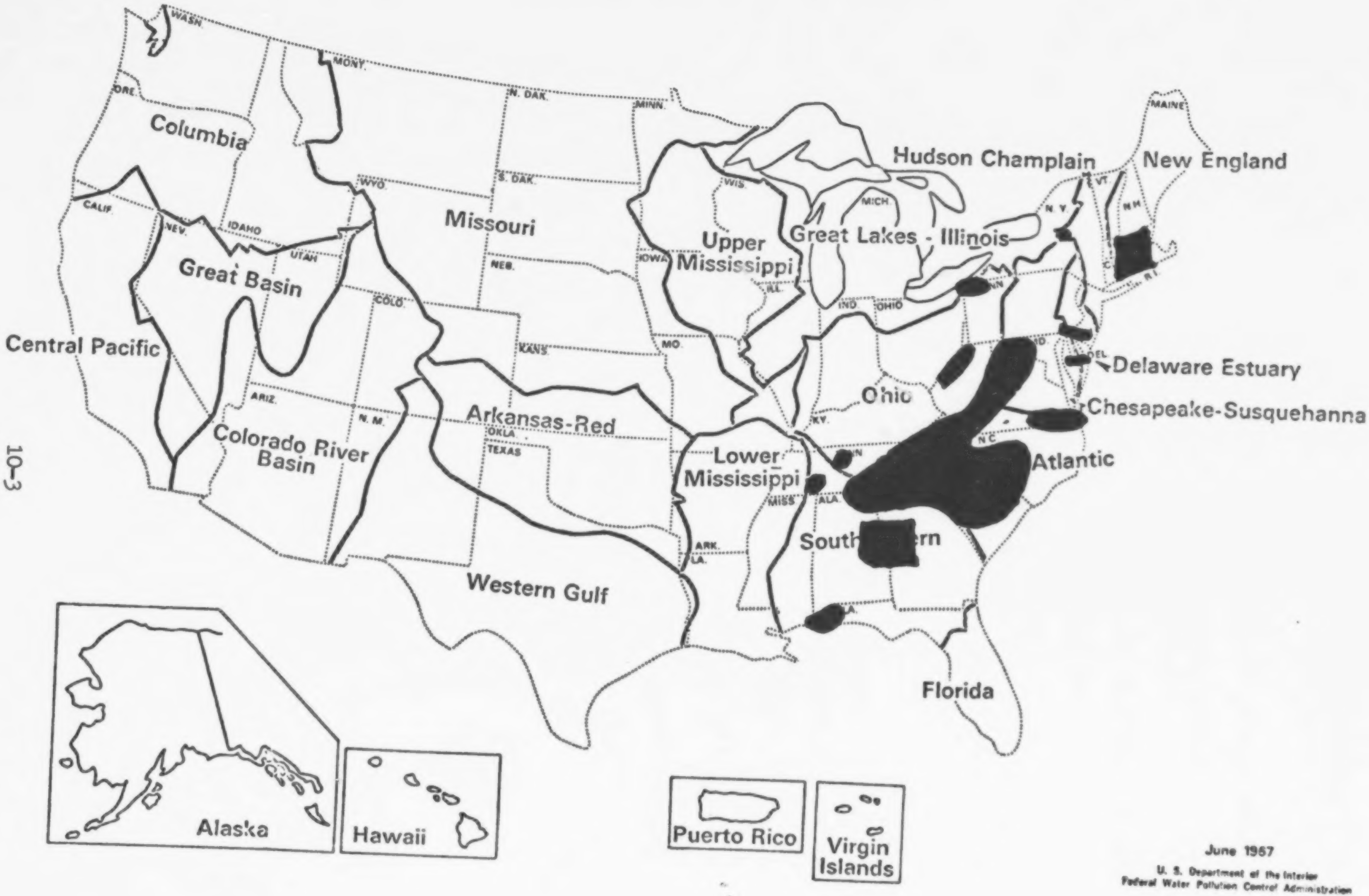
Wool: Scouring, dyeing, washing, carbonizing, bleaching

Non Cellulose Chemical Fiber: Scouring, dyeing, bleaching, special finishing.

Cellulose Chemical Fiber: Chemical preparation, scouring, dyeing, bleaching, special finishes.

In 1964 the textile industry used 315 billion gallons of water for the manufacturing processes. The fresh water intake was approximately 150 billion gallons, the consumption was 10 billion gallons and the industry had a water reuse factor of 2.

LOCATION OF MAJOR FIBER & FINISHING INDUSTRIES
PPB 1209: Textiles Mill Products



Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Delaware Estuary
Chesapeake-Susquehanna
Ohio
Atlantic
Southeastern
Florida
WASH.
ORE.
CALIF.
NEV.
IDAHO
UTAH
MONT.
WYO.
COLO.
ARIZ.
N. M.
N. DAK.
S. DAK.
NEB.
KANS.
OKLA.
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N. Y.
VT.
N.H.
MAINE
R.I.
DEL.
Alaska
Hawaii
Puerto Rico
Virgin Islands

June 1967
U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ECU

TITLE OF PROJECT: Textile Based Water Pollution-Information Study

GRANTEE:
North Carolina State University
Raleigh, North Carolina 27607

PROJECT DIRECTOR:
Robert W. Work
Director of Research
School of Textiles
North Carolina State University
Raleigh, North Carolina 27607

Project Site: Raleigh, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 9, 1969

Project Cost: $12,638

Completion Date: June 14, 1970

Federal Cost: $10,410

DESCRIPTION OF PROJECT

Collection of, abstracting and indexing all available literature dealing with water pollution from textile based sources, and preparation and storage of this information into the Water Resources Scientific Information System. Correlate information between the Water Resources Scientific Information Center, USDI, the M.I.T. Textile Center and the Shirley Institute thesauri.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ECS

TITLE OF PROJECT: Survey of the State of the Art of Textile Waste Treatment

GRANTEE:
Department of Textiles
School of IM & TS
Clemson University
Clemson, SC 29631

PROJECT DIRECTOR:
Dr. John J. Porter

Project Site: Clemson University

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 24, 1969

Completion Date: June 30, 1970

Project Cost: $31,675

Federal Cost: $30,007

DESCRIPTION OF PROJECT

The study will include characterization of the liquid wastes from the major manufacturing processes as to composition and quantity per unit of production, identify successful and unsuccessful treatment processes and disposal practices presently in use, and suggest alternatives for least satisfactory practices. The study will be directed towards identifying areas most in need of research and those areas where research effort is most likely to yield beneficial results.

Address Inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EOX

TITLE OF PROJECT: A Study of the Photochemical Degradation of Commercial Dyes

GRANTEE:
Clemson University
Department of Textiles
Clemson, South Carolina

PROJECT DIRECTOR:
Dr. John J. Porter
Department of Textiles
Clemson University
Clemson, South Carolina 29631

Project Site: Clemson University, Clemson, South Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: August 20, 1969
Project Cost: $34,040

Completion Date: August 20, 1970
Federal Cost: $31,539

DESCRIPTION OF PROJECT

The objectives of this 12 month research project are to define and characterize the products of decomposition resulting from ultraviolet radiation of selected commercial textile dyes. The characterization will include distinquishing between photochemical and hydrolytically produced decomposition products.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EOE

TITLE OF PROJECT: Water Pollution Reduction Through Recovery of Desizing Wastes

GRANTEE:
North Carolina State University
Department of Textile Chemistry
Raleigh, North Carolina 27607

PROJECT DIRECTOR:
Carl E. Bryan
Department of Textile Chemistry
North Carolina State University
Raleigh, North Carolina 27607

Project Site: Raleigh, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Oct. 6, 1969	Project Cost: $39,688
Completion Date: Oct. 6, 1970	Federal Cost: $35,833

DESCRIPTION OF PROJECT

The objectives of this twelve month research project include the following: to investigate processes for the recovery of desizing wastes in solid or concentrated form suitable for disposal, and to investigate processes for the recovery of desizing wastes in a reusable form. The wastes studied will be those from fabrics sized with carboxymethylcellulose (CMC), polyvinyl alcohol (PVA), and starch. In addition, data will be collected concerning the biodegradablity of the synthetic sizes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EUX

TITLE OF PROJECT: Reuse of Plant Effluent and Cooling Water Blowdown as Process Water

GRANTEE:
Fiber Industries, Inc.
Box 10038
Charlotte, North Carolina 28201

PROJECT DIRECTOR:
William J. Day
Davis & Floyd Engineers
P.O. Box 428
Greenwood, North Carolina 29646

Project Site: Shelby, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 18, 1968

Project Cost: $500,000

Completion Date: Feb. 1, 1970

Federal Cost: $350,000

DESCRIPTION OF PROJECT

An existing facility provides treatment for the combined sanitary and equalized chemical process waste waters from a synthetic fiber manufacturing plant. Treatment facilities consist of extended activated sludge aeration basins, clarifier, polishing ponds, aerobic sludge digestion basin, and a sludge holding pond.

The project will evaluate the treatability of this waste in a plastic media trickling filter, the feasibility of algae removal from the polishing pond effluent by use of microscreen filters, the feasibility of BOD, COD, color, odor and taste reduction in the final effluent by use of powered carbon for the purpose of ultimate reuse of the effluent as process makeup water, and chromate reduction of cooling tower blowdown to permit biological treatment.

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ESG

TITLE OF PROJECT: Zinc Precipitation and Recovery Plant

GRANTEE: American Enka Corporation Enka, North Carolina	PROJECT DIRECTOR: David W. Rock American Enka Corporation Enka, North Carolina 28728

Project Site: Enka, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 24, 1968	Project Cost: $980,417
Completion Date: Sept. 1, 1970	Federal Cost: $282,700

DESCRIPTION OF PROJECT

The objective of this 20 month full scale demonstration project is to remove soluble zinc emitted from spin bath operations in the manufacture of viscose rayon. Major activities of the project will include the following:

> To direct waste streams containing significant amounts of zinc into the existing 200 gpm chemical precipitation and recovery system, to improve the quality of both zinc sludge produced in the recovery system and the final effluent to enable their reuse in the manufacturing process, to optimize the system, to utilize the technology developed in the design, construction and operation of a new zinc precipitation and recovery system.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 DWM

TITLE OF PROJECT: Demonstration of a New Process for the Treatment of Textile Dyeing and Finishing Waste

GRANTEE: C. H. Masland & Sons Wakefield, Rhode Island	PROJECT DIRECTOR: William M. Pearson Manager, Waste Treatment Research Fram Corporation Providence, Rhode Island 02916

Project Site: Wakefield, Rhode Island

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 15, 1969	Project Cost: $39,450
Completion Date: July 15, 1970	Federal Cost: $27,615

DESCRIPTION OF PROJECT

The applicant proposes to construct a pilot facility to treat the full flow (50,000 gpd) of process and primary treated sanitary wastes from their Wakefield, Rhode Island plant. The principle operations of the plant are wool and synthetic fiber dyeing and spinning of fibers into yarn. The Pilot Facility will employ a process developed by the Fram Corporation (patent pending) for the biological regeneration of an activated carbon absorption and filtration system.

The plan of operation provides for (a) effluent profile analysis (b) design, construction, operation, testing, and evaluation of the pilot facility (c) development of design criteria for a 1 to 1.5 mgd plant and (d) preparation of reports.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EQO

TITLE OF PROJECT: Demonstration of a New Process for the Treatment of High Pollutant Concentration Textile and Finishing Wastes

GRANTEE:	PROJECT DIRECTOR:
Palisades Industries, Inc. 2 Columbia Street Peace Dale, Rhode Island 02883	Calvin P.C. Poon Department of Civil Engineering University of Rhode Island Kingston, Rhode Island

Project Site: Peace Dale, Rhode Island

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Oct. 3, 1969	Project Cost: $143,750
Completion Date: Feb. 1, 1971	Federal Cost: $64,687

DESCRIPTION OF PROJECT

The project will demonstrate the effectiveness of a pilot scale treatment system which would adequately treat a 50,000 gpd waste flow from a textile dye mill. The system consists of an aerated equalization basin, a anaerobic activated carbon unit, a aerobic activated carbon unit and a activated sludge regeneration unit.

Address Inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EGW

TITLE OF PROJECT: Treatment of Cotton Textile Waste by Enzymes and High Rate Trickling Filter System

GRANTEE:	PROJECT DIRECTOR:
Holliston Mills, Inc. 111 Lenox Street Norwood, Mass. 02060	J. L. Young Holliston Mills, Inc. P.O. Box 478 Kingsport, Tenn. 37662

Project Site: New Canton, Tennessee 37662

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 12/12/69	Project Cost: $285,372
Completion Date: 12/31/72	Federal Cost: $144,741

DESCRIPTION OF PROJECT

The industry concerned purchases cotton greige goods and produces high grade book bindings. The manufacturing processes which produce a waste flow are desizing, caustic extraction, bleaching, dyeing, and sizing. The applicant proposes to substitute an enzyme desizing chemical in the desizing process which will reduce the pH and BOD load of the waste stream. A treatment system employing a primary clarifier, high rate trickling filter with plastic media, and a secondary clarifier will be used to treat the waste flow. The sludge from the treatment system will then be subjected to an enzyme reaction which will render it amenable to further biological oxidation.

The effectiveness of the manufacturing process change, and the operating characteristics and efficiency of the trickling filter and sludge handling system will be evaluated.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 FWD

TITLE OF PROJECT: A Study of Gamma Induced Oxidation of Textile Effluents

GRANTEE:
American Assoc. of Textile
Chemists & Colorists
P.O. Box 12215
Research Triangle Park, NC

PROJECT DIRECTOR:
T. A. Alspaugh
AATCC Committee RA-58
Cone Mills, 4th & Maple Street
Greensboro, NC 27405

Project Site: Oak Ridge, Tennessee

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 5/13/70

Completion Date: 9/12/71

Project Cost: $50,000

Federal Cost: $47,500

DESCRIPTION OF PROJECT

During the project period, work will be initiated to further develop and optimize a high pressure-radiolytic oxidation system. The oxidation system is of laboratory scale size and has initially been involved in joint FWQA/ORNL (Oak Ridge National Laboratory) experiments. Textile mill wastes, such as dyes, special finishing compounds, and other refractory wastes will be subjected to the treatment system. Information from the pilot scale demonstration will be collected concerning optimum operating conditions, radiation dose, temperature, pressure, and the cost of treatment for various types and concentrations of waste.

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

PPB 1210

LUMBER & WOOD PRODUCTS

12100	To	GPO	PM
EBG	Oregon St. Univ. Schaumburg	K. Willard	G. Webster
EZU	Klamath Plywood Corp.	K. Willard	G. Webster
FSI	Hood Industries	R. Hiller	G. Webster

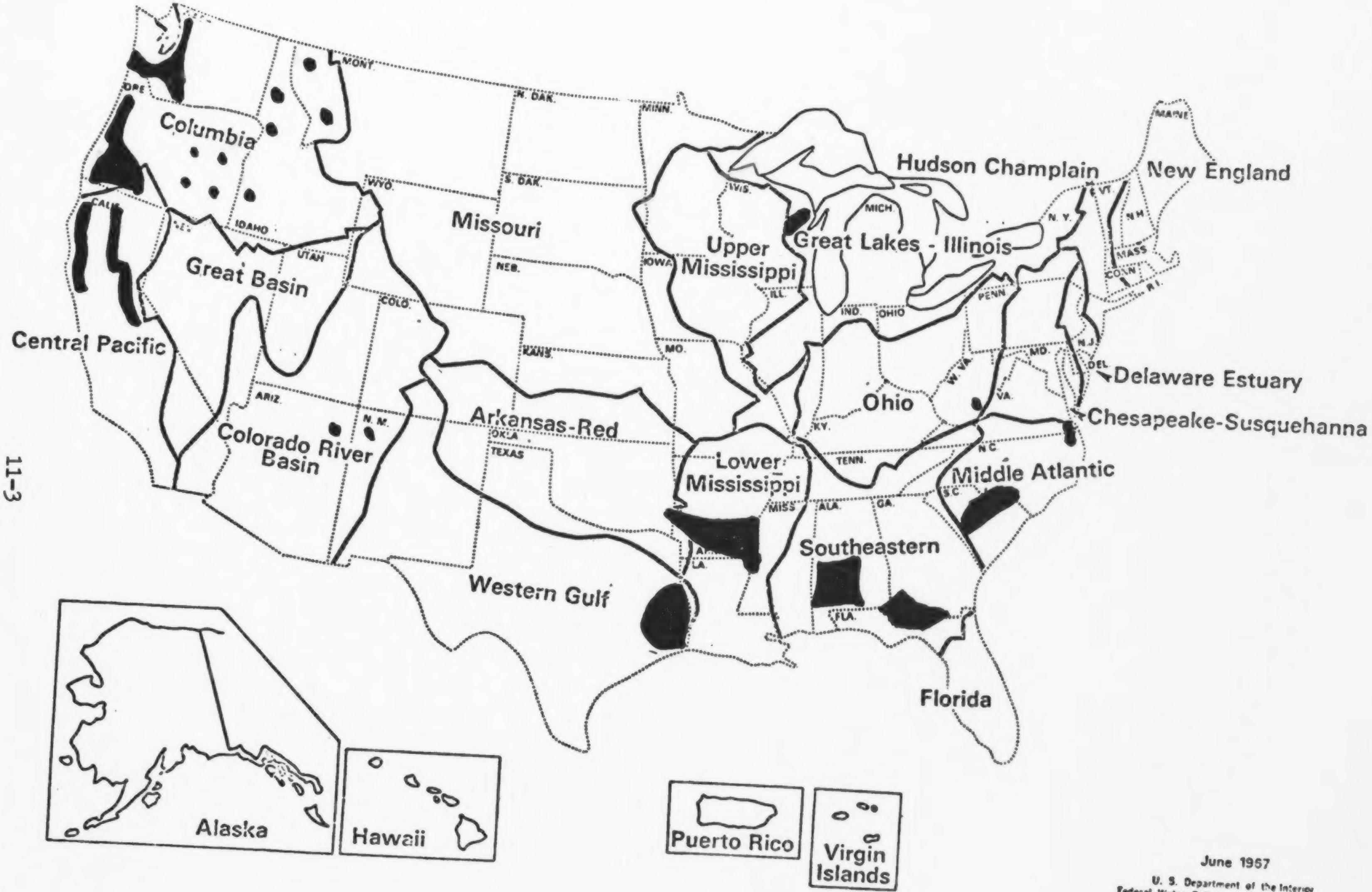
PPB 1210

LUMBER AND WOOD PRODUCTS

George R. Webster, P.E.
Program Manager

Dun and Bradstreet lists 20,672 establishments under Standard Industrial Classification #24, "Lumber and Wood Products, Except Furniture." Wastes from the Wood Preserving and Veneer & Plywood Industries comprises perhaps the greatest problems. The use of such toxic compounds as pentachlorophenol, and heavy metals (such as "CCA" copper, chromium and arsenic) in wood preserving, in addition to urea-formaldehyde and phenolic glues in the plywood industries provides a challange to normal treatment techniques. The development of inplant water-use procedures for minimizing wastes and the study of systems to provide adequate treatment of the wastes that are produced, are the objectives of this program.

LOCATION OF MAJOR SAW MILLS & PLANNING MILLS
PPB 1210: Lumber & Wood Products


Columbia
Central Pacific
Great Basin
Colorado River Basin
Missouri
Arkansas-Red
Western Gulf
Upper Mississippi
Lower Mississippi
Great Lakes - Illinois
Hudson Champlain
New England
Ohio
Delaware Estuary
Chesapeake-Susquehanna
Middle Atlantic
Southeastern
Florida
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MD.
N.J.
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N.C.
S.C.
VT.
N.H.
MAINE
MASS.
CONN.
R.I.
Alaska
Hawaii
Puerto Rico
Virgin Islands

June 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5R *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Lumber and Wood Products
TITLE of PROJECT : Influence of Log Rafting on Water Quality

PROJECT SITE : Corvallis, Oregon

GRANTEE or CONTRACTOR
: Oregon State University
Corvallis, Oregon 97331

PROJECT DIRECTOR
: Dr. Frank Schaumburg

PROGRAM NUMBER
: 12100 EBG

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: $21,740

GRANT or CONTRACT AMOUNT
$20,633 *or* 94.9 %
of eligible project costs.

PROJECT PERIOD
Months :
From : June 1, 1970
To : May 31, 1971

DESCRIPTION of PROJECT :

The project objective is to determine the extent of log raft storage at selected locations in the Pacific Northwest and using data from previous experiments, evaluate the potential contribution of log raft storage to water pollution in those areas.

Research efforts during the first two grant years have provided laboratory and field data which quantitate the pollution contributed by individual logs, log segments and small groups of logs in various water storage situations. These data must now be applied to the vast, but undetermined, quantity of logs in water storage in the Pacific Northwest, so that a reliable estimate of the magnitudes of this pollution source can be made. This information is needed by state pollution control authorities so that log handling and storage activities can be responsibly controlled.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LROWKR 5/70 Washington, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Klamath Plywood Corporation
P. O. Box 1239
Klamath Falls, Oregon 97601

TITLE OF PROJECT:

"Aerobic Secondary Treatment of Plywood Glue Wastes"

PROJECT SITE:	Klamath Falls, Oregon	*DATE AWARDED:*	APR 19 1968
FEDERAL GRANT:	$42,028	*TOTAL EST. PROJ. COST:*	$65,040
PROJECT NUMBER:	WPRD 174-01-(R1)-68 12100 EZU	*PPBS NO.*	1210

DESCRIPTION OF PROJECT:

The project objectives of this grant are to design, construct, operate and evaluate an extended aeration, activated sludge lagoon treatment plant on urea-formaldehyde glue wastes in order to provide data for others to utilize in efforts to abate water pollution.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Lumber and Wood Products

TITLE of PROJECT : "Treatment of Wood Preserving Waste by Chemical and Biological Methods"

PROJECT SITE : Crosby, Mississippi

GRANTEE or CONTRACTOR
: Hood Industries
490 E. Woodrow Wilson
Jackson, Mississippi 39206

PROGRAM NUMBER
: 1210

TOTAL ESTIMATED COST
: $250,000

GRANT or CONTRACT AMOUNT
$170,000 *or* 68 %
of eligible project costs.

PROJECT DIRECTOR
: Lamar Russell
Reynolds, Smith and Hills
Post Office Box 4850
Jacksonville, Florida 32201

GRANT or CONTRACT NUMBER
: 12100 FSI

PROJECT PERIOD
Months : 24 months
From :
To :

DESCRIPTION of PROJECT :

The project objectives are to determine the design and operating parameters of chemical and physical sedimentation and skimming, and biological oxidation of water borne wastes from the wood preserving industry.

The plan of operation consists of design, construction and operation of treatment facilities for all of the waste water from the wood preserving plant of the Crosby Lumber Company, Crosby, Mississippi. The present waste water flow is approximately 200,000 gallons per day and comes from preservation of wood with creosote, pentachlorophenol, and heavy metals such as CCA (copper, chromium, and arsenic).

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDⓌKR 4 /70

PPB 1212

OTHERS

12120	To	GPO	PM
ERC	Res. Fdn. - AWWA-Faber	W. Lacy	W. Lacy
ESW	City of Gainesville, Fl.	E. Lomasney	C. Ris
DOD	Rensselaer Poly-Aulenbech	R. Keppler	G. Rey
185	U. of Cincinnati - Eye	E. Harris	G. Webster
DIK	U. of Virginia - Parker	H. Snyder	G. Webster
EFM	Caldwell Lace Leather Co.	J. Westrick	G. Webster
133	A. C. Lawrence Leather Co.	T. Murphy	G. Webster
DSG	S. B. Foot Tanning Co.	C. Oster	G. Webster
EPC	Blueside Real Estate	O. Olsen	G. Webster
ERF	Berkey Film Processing	J. Ciancia	G. Rey
FYF	Ohio Dept. Nat. Resources	E. Harris	C. Ris
EVR	Am. Water Works Assn.	G. Webster	G. Webster

PPB 1212

MISCELLANEOUS INDUSTRIAL SOURCES

Arthur H. Mallon, P.E.

Industrial wastes which are not clearly identified with any of the foregoing sub-program elements and which are of insufficient number in any one group to justify a separate category, are included in this sub-program element.

This designation should in no way be construed as an indicator of low priority on lack of interest, but rather as a convenience for R&D management purposes.

Activities involving state-of-the-art reporting on disposal of water treatment plant sludges as well as on ways of recovering water treatment chemicals are included in this sub-program. Also, removal of synthetic detergents, reclamation of laundry wastes, as well as water conservation are activities of concern. In addition the various tanning processes, such as chrome, alum, and vegetable tanning are among the projects in the miscellaneous industrial category.

Objectives are to demonstrate the effectiveness of anaerobic-aerobic lagooning of vegetable tanning wastes; to demonstrate the feasibility of treating three types of leather tannages combined; to demonstrate the suitability of treating mixed chrome tannery waste water and sanitary sewage; to investigate the suitability of water renovation and reuse in laundering operations; and to develop means and procedures for the recovery of water softening chemicals and the disposal of water treatment plant sludges.

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec.5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Research Foundation, American Water Works Association.

TITLE OF PROJECT: Disposal of Wastes from Water Treatment Plants.

PROJECT SITE: New York, N. Y.

DATE AWARDED: July 25, 1968

FEDERAL GRANT: $46,305

TOTAL EST. PROJ. COST: $53,250

PROJECT NUMBER: WP-1535-01-69
12120 ERC

PPBS NO. 1212

DESCRIPTION OF PROJECT:

Preparation of a "State of the Arts" report on current practices and costs of disposing of sludges generated by water treatment plants. The results of this 12 month project will be used to develop a program for research and development needs for these significant problems of solids addition to watercourses.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

13-3

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 Research, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: City of Gainesville, Florida
(Name and Address)

PROJECT DIRECTOR: Mr. John R. Kelly, Director
(Name and Address) Public Utilities
P. O. Box 490
Gainesville, Florida 32601

TITLE OF PROJECT: "Develop uses in water and waste treatment of $MgCO_3$ recovered from lime soda softening sludges"

PROJECT SITE: Gainesville, Florida

PROGRAM (PROJECT) NUMBER: 12120 ESW

DATE OFFERED: 11/12/69

DATE ACCEPTED (AWARDED): 12/30/69

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 11/1/69 Thru: 10/31/70	$27,554	$16,890

DESCRIPTION OF PROJECT:

The principal investigator has a modified process for the recovery of MgO from brucite or dolomite to the separation and essentially quantitative recovery of the Mg(OH)2 present in lime-soda softening sludges as very pure (99.7%) $MgCO_3$. This new process has been successfully tested on a pilot plant scale at Dayton, Ohio, for the past year and plans are now being made for the full-scale recovery of $MgCO_3$ from the sludge produced by both of that city's softening plants.

Another improvement of the process makes it possible for each of the several cities and industrial plants softening hard surface waters containing clay turbidity to employ both lime recalcination and magnesium recovery. This will substantially reduce treatment costs and also substantially eliminate a major water pollution problem. Application of $MgCO_3$ as a coagulant to be studied include the following:

1. the removal of turbidity and organic color from soft surface waters.
2. from hard or alkaline surface or well waters.
3. flocculation or sewage and for many types of industrial wastes.
4. with synthetic organic anionic and cationic polymers in (1), (2) and (3) above.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Rensselaer Polytechnic Institute
Research Division
Troy, New York 12181

TITLE OF PROJECT: "Removal of Syndets and Reclamation of Laundry Wastes"

PROJECT SITE: Troy, New York

DATE AWARDED: January 24, 1969

FEDERAL GRANT: $25,055

TOTAL EST. PROJ. COST: $53,090

PROJECT NUMBER: 12120 D0D

PPBS NO. 1212

DESCRIPTION OF PROJECT:

To optimize and evaluate the best process or combination of processes attainable for the treatment and recovery of laundromat wasterwaters. Two commercially available treatment systems for laundromat wastewaters are to be used in the optimization and evaluation project. The needs required to produce waste effluents suitable for discharge to New York State receiving waters, and the treatment requirements to produce reusable water for laundromats will be determined and demonstrated.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: University of Cincinnati
Professor J. David Eye

TITLE OF PROJECT: Treatment of Total Wastes from a Sole Leather Tannery

PROJECT SITE: Marlinton, West Virginia **DATE AWARDED:** May 1, 1968

FEDERAL GRANT: $29,325 - 2nd year **TOTAL EST. PROJ. COST:** $166,000

PROJECT NUMBER: WPD 185-02-68 **PPBS NO.** 1212

DESCRIPTION OF PROJECT: The basic objective of this project is the complete treatment of the total wastes stemming from a large sole leather tannery. During the first year the beamhouse waste fractions were effectively separated and pretreated. During the second year of this grant the pretreated beamhouse waste will be blended with spent tan liquor and then treated in a series of stratified anaerobic-aerobic lagoons.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
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Washington, D. C. 20242

RN 6/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Virginia
Department of Civil Engineering
Charlottesville, Virginia 22903

TITLE OF PROJECT: An Anaerobic-Aerobic Lagoons for Treating Vegetable Tannins

PROJECT SITE: Luray, Virginia **DATE AWARDED:** January 18, 1969

FEDERAL GRANT: $17,801 **TOTAL EST. PROJ. COST:** $68,500

PROJECT NUMBER: 12120 DIK **PPBS NO.** 1212

DESCRIPTION OF PROJECT: The objective of this project is to demonstrate that the wastes from the bating, soaking, tanning, and bleaching processes in a vegetable tannery can be effectively treated by means of an anaerobic-aerobic lagoon. The wastes are to be equalized and combined prior to entering the lagoon. The lagoon is to be operated under varying conditions of aeration and BOD loading in order to determine optimum design parameters.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave., N.W.~~
Washington, D. C. 20242

GRW
1/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Caldwell Lace Leather Company

TITLE OF PROJECT: "Complete Treatment of Tannery Industrial Waste for Chrome Tanning, Alum Tanning, and Vegetable Tanning"

PROJECT SITE: Auburn, Kentucky

DATE AWARDED: December, 1966

FEDERAL GRANT: $46,340

TOTAL EST. PROJ. COST: $68,200

PROJECT NUMBER: WPRD 25-01-67
12120 EFM

PPBS NO. 1212

DESCRIPTION OF PROJECT: No completely satisfactory method has been devised for treating tannery industrial waste. Since tanneries use large volumes of water, containing organic and inorganic matter, suitable treatment methods must be found.

The objectives of the project are to demonstrate the feasibility of completely treating tannery waste from the only plant in U.S. that tans all three types of leather tannages - Chrome, Vegetable and Alum - and to obtain basic data to design full-scale treatment plants usable for any tannery.

The basic plan is to develop methods to pre-treat the three present leather tannages, to combine their streams, and to completely treat tannery industrial waste. The high alkaline content of beam house waste will be neutralized with high acid made up of various tannages. The organic solids will be reduced in an anaerobic-aerobic lagoon.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

GW 1/67

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: A.C. Lawrence Leather Company, Division of Swift &
Company, 10-18 Sawyer Street
Peabody, Massachusetts

TITLE OF PROJECT: "Wastewater Treatment Pilot Plant Investigation, Mixed Chrome Tannery Wastewater"

PROJECT SITE: South Paris, Maine **DATE AWARDED:** 8/30/67

FEDERAL GRANT: $87,215 **TOTAL EST. PROJ. COST:** $124,593

PROJECT NUMBER: WPRD-133-01-68 **PPBS NO.** 1212

DESCRIPTION OF PROJECT: The objectives of the project are as follows:

1) To demonstrate on a pilot plant scale the primary and secondary treatment, by the activated sludge process, of mixed chrome tannery wastewaters and sanitary sewage.
2) To demonstrate the pre-treatment of the tannery wastewater by carbonation with flue-gas and up-flow sedimentation in order to remove excess calcium, chromium, and sulfides.
3) To demonstrate the benefits of mixing municipal sanitary sewage with tannery wastewaters to provide the biological nutrients lacking in tannery wastes.
4) To determine design criteria for a scale up to a full scale demonstration plant and to provide a basis for estimating the costs of construction and operation of a full scale plant.
5) To determine optimum methods of dewatering sludge, with primary emphasis on concentration by centrifugation, with aim being to dewater sufficiently to dispose of solids as sanitary land fill.

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

GRW 10/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: S. B. Foot Tanning Company
Red Wing, Minnesota

TITLE OF PROJECT: "Aerobic Biological Treatment, Sludge Dewatering and Disposal and Effluent Reuse for a Side Leather Tannery"

PROJECT SITE: Red Wing, Minnesota

DATE AWARDED: May 15, 1968

FEDERAL GRANT: $475,000

TOTAL EST. PROJ. COST: $2,046,268

PROJECT NUMBER: WPRD 232
12120 DSG

PPBS NO. 1212

DESCRIPTION OF PROJECT:

The four year project will provide a full scale demonstration and investigation of primary sedimentation, biological secondary treatment utilizing aerated lagoons, and primary and secondary sludge dewatering and disposal by means of pressure filtration and incineration. The system will treat the total waste flow of 2.1 MGD from the side leather tannery. In addition an evaluation will be conducted to determine the influence of final treatment plant effluent reuse on hide processing and quality of the finished product by reusing it in the "limepaddle" and "wash soak" tanning operations.

INQUIRIES: *Contact the* INDUSTRIAL POLLUTION CONTROL BRANCH, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Leather Tanning and Finishing

TITLE of PROJECT: "Removal and Recovery of Sulfide from Tannery Wastes"

GRANTEE or CONTRACTOR
: Blueside Real Estate, Inc.
800 N. Atlantic Ave.
Kansas City, Missouri 64116

PROGRAM NUMBER
: 12120 EPC

TOTAL ESTIMATED COST
: $388,900

GRANT or CONTRACT AMOUNT
$110,950

PROJECT DIRECTOR
: Henry R. Hannon
800 N. Atlantic Ave.
Kansas City, Missouri 64116

PROJECT SITE
: St. Joseph, Missouri

PROJECT PERIOD
Months : 24
From : April 13, 1970
To : April 13, 1972

DESCRIPTION of PROJECT:

The basic objectives of the project are to translate pilot plant results into the development and demonstration on a plant scale of a process for removing sulfide from the effluent of a chrome tannery and recovering the sulfide in a form reuseable in the tannery. The project will demonstrate the technical feasibility of the sulfide removal method and will determine the economics of the process on a full scale plant.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDⓌKR 2 /70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Treatment of Complex Cyanide Compounds for Reuse and Disposal
PROJECT SITE : Rochester, New York

GRANTEE or CONTRACTOR
: Berkey Film Processing
260 Lunenburg Street
Fitchburg, Massachusett
01420

PROGRAM NUMBER
: 12120 ERF

TOTAL ESTIMATED COST
: $163,576

GRANT or CONTRACT AMOUNT
$ 114,415 *or* 70 %
of eligible project costs.

PROJECT DIRECTOR
: Thomas N. Hendrickson
474 Thurston Road
Rochester, New York 14625

GRANT or CONTRACT NUMBER
:

PROJECT PERIOD
Months : 12
From : 1 Jan. 70
To : 1 Jan. 71

DESCRIPTION of PROJECT :

To research and develop methods for the treatment of ferrocyanide waters from film processing, for recovery and disposal. Recovery methods to be explored are: (1) ozonation, and electrolytic oxidation to Ferricyanide. Treatment for diposal include: (1) ozonation for destruction; (2) Precipitation of complex cyanides; and (3) chlorination.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWKR 4/70 *Washington, D.C. 20242*

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12120 FYF

TITLE OF PROJECT: Fluidized-Bed Incineration of Selected Carbonaceous Industrial Wastes

GRANTEE:
Ohio Department of Natural Resources
Ohio Departments Building
Columbus, Ohio 43215

PROJECT DIRECTOR:
David Papier
Ohio Dept. of Natural Resources
Ohio Departments Building
Columbus, Ohio 43215

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 25, 1970	Project Cost:	$140,818
Completion Date:	June 30, 1971	Federal Cost:	$ 98,573

DESCRIPTION OF PROJECT

The Ohio Department of Natural Resources with the assistance of the Battelle Memorial Institute of Columbus, Ohio, will undertake a 12 month project with the following objectives: (1) evaluate the characteristics of aqueous wastes from selected industries to determine their amenability to fluidized-bed incineration, (2) determine the conditions required for burning the selected wastes so that the carbonaceous constituents will be eliminated without the production of noxious gases or other air pollution problems, (3) assess the overall technical and economic feasibility of fluidized-bed incineration for each waste under consideration. The wastes to be studied will be from the paint, textile, rubber, and plastics industries.

The application and use of the fluidized-bed process to water pollution control provides an effective means of treating certain types of industrial wastes with the elimination of the discharge of pollutants into streams and sewers.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12120 EUR

TITLE OF PROJECT: Information Resource for Water Pollution Control in the Water Utility Industry

GRANTEE:
American Water Works Assoc.
Research Foundation
2 Park Avenue
New York, N. Y. 10016

PROJECT DIRECTOR:
Harry Faber
AWWA, Research Foundation
2 Park Avenue
New York, N. Y. 10016

Project Site: New York, N.Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 26, 1970

Completion Date: June 30, 1971

Project Cost: $42,720

Federal Cost: $24,990

DESCRIPTION OF PROJECT

The objective of this 12 month project is to establish a research and development oriented information resource for the water utility industry. The information center will provide efficient collection, synthesis, and dissemination of information pertaining to the development and demonstration of water pollution control technology within the water utility industry.

The available literature concerning the water pollution control technology of the water industry will be abstracted and indexed for the Water Resources Scientific Information Center.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

PPB 1213

JOINT INDUSTRIAL-MUNICIPAL

12130	To	GPO	PM
DLF	Tualatin, OR	M. Kiado	G. Keeler
EZR	Dallas, OR	K. Dostal	G. Keeler
EDX	Green Bay, WI	C. Swanson	G. Webster
FAE	Onondaga, NY	L. Townsend	G. Rey
EKK	South St. Paul, MN	C. Oster	G. Keeler
EJD	Hagerstown, MD	H. Snyder	C. Ris
DJB	Grand Forks, ND	O. Olsen	G. Keeler
EOC	Erie, PA	G. Webster	G. Webster
EGK	Jacksonville, AR	G. Putnicki	G. Rey
DBF	Harriman, TN	E. Lomasney	G. Webster
DUJ	Walton, NY	A. Richardson	G. Keeler
DPD	Macon, GA	E. Lomasney	G. Webster
DRT	Stockton, CA	J. Robertson	G. Keeler
DRO	Delaware R. Basin Comm.	C. Paul	G. Rey
ENF	State of Vermont		G. Keeler
FJQ	Kodiak, AK	K. Dostal	G. Keeler
FAY	Brooksville, FL	D. Hill	G. Keeler

PPB 1213

JOINT INDUSTRIAL-MUNICIPAL WASTES

ARTHUR H. MALLON, P.E.

Joint Industrial-Municipal Wastes are those wastes, treatable at a municipal waste treatment plant, which contain an appreciable amount of waste originating from industrial sources. Projects included in this subprogram activity are those in which the industrial load is more than the municipal domestic load.

Among the broad objectives of this subprogram are the demonstration of the suitability for joint treatment of various categories of industrial waste; the permissible proportions of a particular industrial to domestic waste; the ability of various joint systems to satisfy municipal plant effluent standards; and the capability of joint treatment systems to renovate wastewaters for reuse.

Industries involved in the processing of minerals, carbohydrates, hydrocarbons, refractory material, and protein material are of most concern. The wastes are voluminous and of great variety. They may originate in any of the industries represented by any of the 1200 subprogram elements. Their volume and composition are best described in the write-ups of the respective industrial pollution control technology subprogram elements.

Use of municipal facilities is preferred by a majority of the smaller industries, and accounts for the largest number of establishments whose wastes are treated. From a volume standpoint about three-fourths of industrial wastes are currently treated in industrial waste treatment facilities and one-fourth are treated in municipal facilities.

Although only 7.5% of the wastewaters of major industrial establishments are being disposed of to municipal sewers, sewering provided the principal waste disposal method for seven of the 11 industrial sectors. The seven industries include food processing, textiles, rubber and plastics, machinery, electrical machinery, transportation equipment, and miscellaneous manufacturing. The wastes of these seven industries are more amendable to treatment at municipal treatment plants than the wastes of the four other industries; paper and allied products, chemicals, petroleum and coal, and primary metals.

In connection with the trend toward increased use of municipal facilities by many industries, it is important to note the rapid increase in municipal treatment capabilities. Both the number of treatment plants and the average level of treatment have risen steadily, the growth being most marked since the institution of Federal grants for construction of waste treatment plants. As recently as 1960, almost 30% of the nation's sewered communities did not have waste treatment provided to them. By 1962, less than 20% of the total number of sewered communities were without waste treatment. In 1970 less than 10% are without some degree of waste treatment. Moreover, well over two-thirds of the sewered communities now have secondary waste treatment facilities. Thus, municipal facilities have an increasing potential capacity for handling many industrial wastes.

Joint systems for treating both municipal and industrial wastes in many cases are likely to provide the means of attaining adequate water pollution control most effectively and least expensively. The extent to which joint handling systems will increase over the next five years depends largely upon the managerial ability of municipal and industrial officials and their willingness to enter into such cooperative arrangements. This, in turn, will depend upon the costs which industrial establishments are required to pay to use municipally-operated facilities. To the extent that appropriate charges and pretreatment requirements are fixed and that joint treatment facilities are designed and operated effectively, increased use of such facilities by industry may well lower overall pollution control costs significantly over the next five years.

Reduction of many industrial wastes is often accomplished most efficiently and economically by process modifications. While the rate and effects of technological change are difficult to evaluate, quantities of water used per unit of production have been decreasing in most industries while recycling to make more efficient use of water is increasing. Moreover, modern operational practices and engineering design increasingly stress waste control.

Industrial waste treatment costs are affected significantly by the methods industry employs to reduce its wastes. In general, waste reduction may be accomplished through treatment by municipal facilities, by on-site treatment, through process changes which lessen the amount or strength of wastes generated, by ground disposal, or by combinations of these alternatives.

There is potentially great savings through the "economy of scale" when the treatment facilities are designed to serve joint municipal-industrial needs. It is the intention of our program to thoroughly research this area. Included here is the possibilility of encouraging industries to utilize the municipal waste handling systems on a special fee basis.

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of Tualatin, Oregon

TITLE OF PROJECT: Tertiary Treatment of Combined Domestic/Industrial Wastes

PROJECT SITE: Tualatin, Oregon

DATE AWARDED: March 20, 1968

FEDERAL GRANT: $230,800

TOTAL EST. PROJ. COST: $323,600

PROJECT NUMBER: WPRD-27-01-67
12130 DLF

PPBS NO. 12130

DESCRIPTION OF PROJECT: A secondary and tertiary sewage treatment plant will be constructed for treatment of combined municipal and industrial wastes. The industrial waste is generated by the manufacture of dog food and will comprise 25% of the BOD load on the treatment plant. The plant will be operated and studied for a period of one year. The tertiary plant (consisting of flocculation, settling and filtration) will be operated with the addition of alum for phosphate removal during the critical 6 months of low stream flow. During the remainder of the year, the secondary effluent will receive plain filtration to maintain a very high quality effluent. The feasibility of alternate methods of chemical sludge disposal and the economics of tertiary treatment with phosphate removal will be studied.

FWPCA PROJECT OFFICER: Michael Kiado

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible]
Washington, D. C. 20242

4/68

HGK

14-4

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: City of Dallas, Oregon

TITLE OF PROJECT: Complete Aerobic Treatment of Combined Domestic and Industrial Wastes with Mechanical Aeration

PROJECT SITE: Dallas, Oregon

DATE AWARDED: Dec. 12, 1967

FEDERAL GRANT: $325,104

TOTAL EST. PROJ. COST: $463,472

PROJECT NUMBER: WPRD-29-01-67
12130 EZR

PPBS NO. 12130

DESCRIPTION OF PROJECT: Design and build a treatment plant to demonstrate the economics and efficiency of the completely aerobic treatment method when applied to the treatment of combined domestic and industrial wastes from a small municipality. The industrial waste is generated by fruit canning operations and by plywood glue manufacture and will comprise 75% of the BOD load on the treatment facility. The application of aerobic digestion, mechanical surface aeration, and earthen embankment construction will be demonstrated.

STATUS OF PROJECT: Work ongoing.

PROJECT DIRECTOR: Sidney S. Lasswell, CH_2M, Corvallis, Oregon.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: Green Bay Metropolitan Sewerage District
Green Bay, Wisconsin

TITLE OF PROJECT: "Combined Industrial and Municipal Waste Treatment"

PROJECT SITE: Green Bay, Wisconsin

DATE AWARDED: December 1966

FEDERAL GRANT: $251,250

TOTAL EST. PROJ. COST: $335,000

PROJECT NUMBER: WPRD-60-01-67
12130 EDX

PPBS NO. 12130

DESCRIPTION OF PROJECT: The project will be a study, evaluation, and determination of the effectiveness, design, and operating parameters of four alternative biological treatment processes and modifications for treating combined municipal and industrial (primarily paper mill) waste waters. A pilot waste water treatment plant for each process will be operated in parallel. The effluent quality, operating parameters, design variables, and cost relationships for each process will be determined. Each pilot plant will have a 1 to 10 gpm capacity for combined waste waters. After selecting the most promising process, an existing 60 gpm pilot plant will be modified to suit the selected process and will be operated for a year to demonstrate its performance and to generate performance data. The final objective is to evaluate the design, performance, and use of the systems and to generalize the results for applicability to other locations.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Onondaga County, N.Y.

TITLE OF PROJECT: A Demonstration of Joint Municipal-Industrial Waste Treatment in the Onondaga Lake Watershed

PROJECT SITE: Onondaga County, N.Y.

DATE AWARDED: 8 September, 1967

FEDERAL GRANT: $357,150

TOTAL EST. PROJ. COST: $507,700

PROJECT NUMBER: WPRD-66
12130 FAE

PPBS NO. 12130

DESCRIPTION OF PROJECT:

Onondaga Lake has been a receptor of domestic and industrial wastes to such an extent that it is now in an advanced stage of eutrophication. This project is part of a twenty million dollar program to restore Onondaga Lake.

The objectives of this project are: (1) to demonstrate county-industry cooperative wastewater management of municipal-industrial wastes based on an entire watershed, (2) to demonstrate feasibility of treatment of mixtures of industrial and domestic wastes, (3) to demonstrate the treatment of an industrial waste stream with the waste effluent from another industry, (4) to evaluate the effects of proposed management and treatment methods on the economics of the treatment processes and on the restoration of the lake.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68 GR

14-7

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6,a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of South St. Paul, Minnesota

TITLE OF PROJECT: "Efficiency and Economy of Polymeric Sewage Clarification"

PROJECT SITE: South St. Paul, Minn. **DATE AWARDED:** June 15, 1967

FEDERAL GRANT: $450,000 **TOTAL EST. PROJ. COST:** $845,159

PROJECT NUMBER: WPRD 111-01-67
12130 EKK
PPBS NO. 12130

DESCRIPTION OF PROJECT:

The Demonstration Project includes construction of (1) New Grit Chambers (4 units) two for industrial wastes, one for sanitary sewage and one for either industrial or sanitary wastes. These grit chambers will allow sewage to be treated individually or in combination of the two basic sewages in the treatment process following grit removal; (2) Mechanical flash mix-facilities, laboratory and utility building improvements and the necessary piping and other appurtenant construction. The City will also construct an interceptor sewer, sludge ejector and pumping station in conjunction with the demonstration project but is not a part of this demonstration grant request. The project objectives are to determine the increased purification attainable by treating industrial wastes (packing house), sanitary sewage, combined sanitary sewage, and stormwaters or combinations of such wastes with polyelectrolytes and floc "weighting agents."

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11060 EJD

TITLE OF PROJECT: A Pretreatment Study on Combined Industrial-Municipal Waste Waters

GRANTEE:
City of Hagerstown, Maryland

PROJECT DIRECTOR:
David S. Kappe
Kappe Associates, Inc.
P. O. Box 1036
Rockville, Maryland 20850

Project Site: Hagerstown Sewage Treatment Plant, Hagerstown, Maryland

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 15, 1968

Project Cost: $427,853

Completion Date:

Federal Cost: $320,890

DESCRIPTION OF PROJECT

This project is to evaluate pretreatment techniques for textile dyeing wastes. The dye wastes are reduced sulfur compounds with a high immediate and ultimate oxygen demand that cannot be satisfied in an activated sludge system. The pretreatment technique is to provide initial oxidation by diffused aeration, chlorination, and the separate additions of sodium nitrate and potassium permanganate. Ammoniation will also be used. The project will be for two years and include a waste source investigation, detailed baseline analyses, construction of the pretreatment facilities and full scale paralleling of the treatment system, and evaluation of the pretreatment techniques.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of Grand Forks, North Dakota
P.O. Box 1518
Grand Forks, North Dakota

TITLE OF PROJECT: Controlled Treatment of Combined Potato Processing-Municipal Wastes by Anerobic Fermentation, Aerobic Stabilization Process

PROJECT SITE: Grand Forks, N.D. **DATE AWARDED:** JUL 17 1968

FEDERAL GRANT: $389,478 **TOTAL EST. PROJ. COST:** $796,904

PROJECT NUMBER: WPRD-206-01-R1 **PPBS NO.** 12130
12130 DJB

DESCRIPTION OF PROJECT: A full scale 4.5 mgd demonstration and evaluation of the joint treatment of municipal sewage in conjunction with potato processing wastes using several pretreatment methods prior to final treatment in existing stabilizations ponds. The pretreatment methods include anerobic and aerated treatment, in series, anerobic treatment alone, and aeration alone, under varying seasonal waste load conditions.

In addition to determining the most efficient operation of the pretreatment methods, their effects on the conventional stabilization ponds will be extensively determined.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

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14-10

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, i (2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: City of Erie
Erie, Pennsylvania

TITLE OF PROJECT: "Joint Treatment of Domestic Sewage and Pulp and Paper Mill Industrial Wastes."

PROJECT SITE: Erie, Pa.

DATE AWARDED: JUN 20 1968

FEDERAL GRANT: $88,230

TOTAL EST. PROJ. COST: $333,674

PROJECT NUMBER: WPRD-223-01-68
12130 EOC

PPBS NO. 12130

DESCRIPTION OF PROJECT:

This project is a 20 GPM pilot plant study to determine the feasibility of combining the treatment of normal domestic sewage and the weak wastes from a neutral sulfite semichemical pulp and paper mill.

One of the primary parameters of study will be the possible uptake of sewage neutrients by the treatment with equal volumes of the neutrient deficient pulping wastes. Full economic and design factors will be developed.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

GW:5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: CITY OF JACKSONVILLE, ARKANSAS

TITLE OF PROJECT: "Demonstration of a Facility for the Biological Treatment of Complex Chlorophenolic Wastes.

PROJECT SITE: Jacksonville, Arkansas

DATE AWARDED: May 17, 1968

FEDERAL GRANT: $153,569

TOTAL EST. PROJ. COST: $243,313

PROJECT NUMBER: WPRD 246-01
12130 EGK

PPBS NO. 12130

DESCRIPTION OF PROJECT:

A full scale (2-4 MGD) demonstration and evaluation of the joint treatment of industrial herbicide and municipal wastes, by the use of a municipal biological system composed of: primary clarification, bio-filters, aerated and stabilization ponds. The herbicides are of the chloro and chloro-oxyacetic acid deriviatives of phenol. Investigations will be conducted to determine how the concentration of the phenolics in a receiving stream can be reduced to a level below the tests and odor threshold, also to investigate the biological factors related to the removal of the herbicides during treatment. Suitable methods are to be developed for the identification of the various herbicide compounds. The adequacy of nutrient values in the joint waste to allow complete bio-processing of chlorophenolics and related compounds will also be demostrated

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

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GR

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: Harriman Utility Board
P. O. Box 434
Harriman, Tennessee 37748

TITLE OF PROJECT: "Treatment of Combined Sewage and Neutral Sulfite Semichemical (NSSC) Pulp and Paper Mill Wastes by High-Rate Biological Filtration and Extended Aeration."

PROJECT SITE: Harriman, Tennessee

DATE AWARDED: Jan. 17, 1969

FEDERAL GRANT: $238,905

TOTAL EST. PROJ. COST: $322,540

PROJECT NUMBER: 12130 DBF

PPBS NO. 12130

DESCRIPTION OF PROJECT:

Project Objectives: To investigate the significant factors affecting the treatment of combined municipal sewage and NSSC pulp and paper mill wastes by high rate biological filtration and extended aeration, separately or in combination, and to establish design criteria, operating parameters and treatment efficiencies.

Grant Duration: two (2) years

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. N.W.*~~
Washington, D. C. 20242

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GRW

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: Village of Walton
Village Hall
21 North Street
Walton, N.Y. 13856

TITLE OF PROJECT: "Dynamic Process Development for Biological Treatment of Whey Bearing Wastes"

PROJECT SITE: Walton, New York
Hastings on the Hudson, N.Y.

DATE AWARDED: Feb. 18, 1969

FEDERAL GRANT: $52,730

TOTAL EST. PROJ. COST: $80,047

PROJECT NUMBER: 12130 DUJ

PPBS NO. 12130

DESCRIPTION OF PROJECT:

Efforts of this one year bench and pilot study will be concentrated in resolving problems associated with biological treatment of wastes from the manufacture of cheese and associated dairy products. Frequency response techniques will be employed in the development of activated sludge systems with stable culture separation characteristics. Odor control techniques will be evaluated in packed tower trickling filter studies. A selected process will be employed in an on site pilot plant.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
Washington, D. C. 20242

2/69

HGK

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6, (a 2), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: The City of Macon
(Name and Address)
City Hall
Macon, Georgia 31201

PROJECT DIRECTOR: Emory C. Matthews
(Name and Address)
Executive Secretary
Board of Water Commissioners
780 Third Street - Macon, Georgia 31201

TITLE OF PROJECT: "Pilot study of Treatment of Combined Municipal and Industrial Wastes in Selected primary and biological secondary facilities for the Reduction of Waste Materials Discharged to Receiving Streams."

PROJECT SITE: Macon, Georgia

PROGRAM (PROJECT) NUMBER: 12130 DPD

DATE OFFERED: Feb. 3, 1969

DATE ACCEPTED (AWARDED): Feb. 19, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 2/19/69 Thru: 2/18/70	$ 171,845	$128,883.75

DESCRIPTION OF PROJECT:

Project Objectives: The objective of this study is to develop information relating to the joint treatment of municipal and industrial wastes. The industrial wastes will be selected wastes from both pulp and paper, and wood products companies. The study will be accomplished on a pilot plant basis.

Grant Duration: one year

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

GRW 6/19

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE:
City Council
City of Stockton
Stockton, California

TITLE OF PROJECT: "Upstream Packing House Waste Treatment Demonstration, City of Stockton"

PROJECT SITE: Stockton, California

DATE AWARDED: Feb. 25, 1969

FEDERAL GRANT: $381,078

TOTAL EST. PROJ. COST: $1,085,970

PROJECT NUMBER: 12130 DRT

PPBS NO. 12130

DESCRIPTION OF PROJECT: A full scale (2 MGD) development and demonstration of upstream treatment of packinghouse waste by use of aerobic treatment in a combination use of high rate activated sludge and in-sewer treatment. The complex is anticipated to result in the reduction of BOD load to the municipal system of 80 percent and demonstrate the utility value of the conveying sewer line to further treat sewage and to reduce capitol expenditures over a typical activated sludge plant otherwise required. It is intended to consider the use of the Kehr process for partial upstream treatment during pilot studies.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

2/69

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Delaware River Basin Commission
25 Scotch Road - P.O. Box 360
Trenton, New Jersey 08603

TITLE OF PROJECT: Deepwater - Pilot Plant - Engineering and Interceptor Feasibility Study

PROJECT SITE: Salem County, N. J. **DATE AWARDED:** April 1, 1969

FEDERAL GRANT: $646,700 **TOTAL EST. PROJ. COST:** $995,650

PROJECT NUMBER: 12130 DRO **PPBS NO.** 12130

DESCRIPTION OF PROJECT: A pilot plant and engineering study to develop a chemical-biological treatment process for joint industrial-municipal wastes, capable of attaining at least 88 to 93 percent removal of major pollutants. Design, operating and cost information is to be obtained for a 80 MGD regional treatment complex. To test and evaluate Advanced Waste Treatment processes for final effluent polishing. To develop suitable cost apportionment formulations for the treatment of various industrial wastes by a joint regional complex operated by an interstate Agency. To develop and demonstrate the requirements for organizing, operating and administering a regional facility by an Interstate Agency.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class IV, under Section 6 a(2), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)	Department of Administration State of Vermont Montpelier, Vermont 05602
PROJECT DIRECTOR: (Name and Address)	Mr. John M. Simmonds Department of Administration State of Vermont Montpelier, Vermont 05602
TITLE OF PROJECT:	"Vermont Cheese Industry Pollution Abatement"

PROJECT SITE: East Georgia and East Wallingford, Vermont

PROGRAM (PROJECT) NUMBER: 12130 ENF

DATE OFFERED: September 19, 1969

DATE ACCEPTED (AWARDED): January 16, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Thru:	$2,040,900	$832,120

DESCRIPTION OF PROJECT:

A three year comprehensive program with an estimated total cost of $3,700,000 is planned for pollution abatement from the cheese industry, which contributes approximately 80 percent of the industrial BOD load in the State of Vermont. The program will demonstrate the feasibility of economically eliminating 95 percent of the total whey produced in the State by use of a central whey drying facility which will produce material suitable for human consumption. This facility, to be located in East Georgia, Vermont, will have a processing capacity of 375,000,000 pounds of fluid whey per year. A study of unit process operations of Chedder, Cottage, Bakers and Mozzarella plants will be conducted to increase solids recovery and minimize waste generation. Concentration of, and utilization of cottage cheese rinse waters is planned, as well as determination of most suitable forms of treatment for the residual wastes.

INQUIRIES: Contact Industrial Pollution Control
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior 14-18

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS IV Grant *awarded under Section* 6(a)(2) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products

TITLE of PROJECT : Pollution Abatement & By-Product Recovery in Shellfish and Fisheries Processing - Phase I

PROJECT SITE : Kodiak, Alaska

GRANTEE or CONTRACTOR
: City of Kodiak
Box 685
Kodiak, Alaska 99615

PROJECT DIRECTOR
: Lee Johnson
Food, Chemical Research Laboratories, Inc.
4900 Ninth Ave., N.W.
Seattle, Washington 98107

PROGRAM NUMBER
: 1213

GRANT or CONTRACT NUMBER
: 12130 FJQ

TOTAL ESTIMATED COST
: $101,800

PROJECT PERIOD
Months : 12
From : April 6, 1970
To : April 6, 1971

GRANT or CONTRACT AMOUNT
$49,952 *or* 57%
of eligible project costs.

DESCRIPTION of PROJECT :

This is a 12 month Research and Development project to evaluate the various parameters involved in demonstrating the feasibility of constructing and operating a by-product recovery system for shellfish and fishery processing plants. Objectives include:

(1) Engineering survey of industrial waste quantities,

(2) conduct pilot plant experiments on by-product operations, and

(3) prepare pre-construction summary report.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWQR

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12130 FAY

TITLE OF PROJECT: Aerobic-Anaerobic Pretreatment of Citrus Wastes

GRANTEE:
City Commission
City Hall
Brooksville, Florida 33512

PROJECT DIRECTOR:
C. E. Manuel
City Engineer
617 Lamar Avenue
Brooksville, Florida 33512

Project Site: Brooksville, Florida

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 30, 1970	Project Cost:	$132,581
Completion Date:	March 1, 1972	Federal Cost:	$88,161

DESCRIPTION OF PROJECT

During the 20 month grant period, the grantee will verify the design parameters for, and determine the feasibility of operating, an aerobic-anaerobic pretreatment system for a citrus fruit processing plant. The treatment facility will be located on city property and will be operated by the City. The pretreatment system consists of two aerobic basins with mechanical aerators and two anaerobic basins. These basins will be operated in sequences and combinations and under various biological conditions to determine the optimum system. The hydraulic capacity of the system is 144,000 gallons per day with effluent requirements of 250 mg/l BOD, 100 mg/l Suspended Solids, and a PH of 6.5-8.5.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

MARCH 3, 1849